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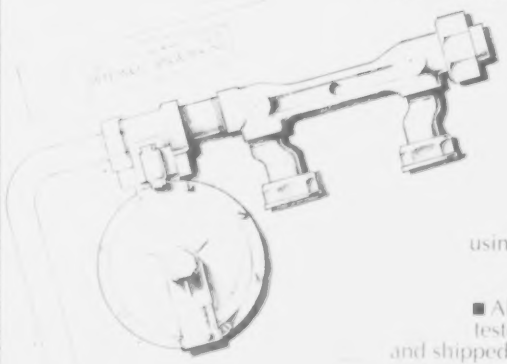

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FEATURES

ON THE COVER
U.S. gas utilities will install thousands of miles of plastic mains and services in 1991 and 1992 to serve new customers as well as improve the service to existing users. (Photo courtesy Washington Gas Light)

NEXT MONTH P&GJ's U.S./Canadian Report will provide details on new and proposed pipeline projects, a study on U.S. pipeline flow patterns and updates on major energy pipeline construction efforts.

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U.S. gas utilities will spend more than $4.4 billion in 1992 to install 27,000 miles of distribution piping and maintain the existing network.

14 Correct PE Pipe Installation
Installation techniques developed through field experience and laboratory research can ensure that PE gas piping enjoys a long, useful service life.

20 Methane Leakage In Gas Operations
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Pipeline pigs are important tools in the commissioning, maintenance and operations of energy pipelines, with new advances providing additional capabilities.

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40 Ultrasonic Inspection System
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Special Report

Gas Utility Spending Stays At High Level

26th Annual
PIPELINE & GAS JOURNAL
Distribution Piping Report

Despite being buffeted by warmer-than-usual weather and a decline in residential construction, U.S. gas utilities spent more than $4.15 billion in 1991 to maintain the existing distribution system and extend gas service to new customers. Next year should be a busy year for gas companies and contractors across the U.S., with expected expenditures of $4.4 billion and installation of more than 27,000 miles of steel and plastic mains and services.

Gas utility spending should stay above the $4-billion market for several years, according to utility executives surveyed for the 26th Annual PIPELINE & GAS JOURNAL Distribution Piping Report, as new customers are added and aging, existing distribution systems are maintained, upgraded and replaced.

The 3Rs—Repair, Rehabilitate, Replacement—activities accounted for 53.6% of the total 1991 gas utility construction maintenance expenditures, as gas utilities pay close attention to protecting their investment in distribution networks. However, projections for 1992 show the 3Rs maintaining only a slight edge over new construction, with 50.2% of the total.

Utilities installed a total of 25,654 miles of gas distribution piping in 1991. Expected mileage for 1992 is 26,144 miles of pipeline.

U.S. gas utilities spent a total of $1,928,472,000 on installation of new pipeline to serve a growing customer base. Natural gas is attractive for many reasons, and utilities are expanding their systems to serve communities that did not have gas service. New construction activities accounted for 46.4% of the total $4,157,778,000 spent by U.S. gas utilities in 1991.

Expenditures for 1992 new construction are expected to reach $2.193 billion, or 49.8% of total anticipated expenditures of $4.4 billion next year.

New pipeline mileage installed during 1991 to serve new customers totaled 17,537 miles, including 10,085 miles of mains and 7,452 miles of service lines.

In 1992, companies said they expect to install a total of 19,071 miles of pipeline to serve new customers, including 10,707 miles of new mains and 8,364 miles of new service lines.

Although many companies rely on distribution contractors for all or part of their new construction work, survey results indicate that U.S. gas utilities spent $860.070 million on new construction equipment in 1991, going to an expected $900.675 million in 1992.

As has been the case in recent years, 3Rs activities continued to dominate gas utility budgets in 1991. An estimated $2.229 billion was spent on maintaining, upgrading and otherwise improving the U.S. gas distribution network in 1991, with expected expenditures for 1992 exceeding $2.206 billion.

The 3Rs accounted for 53.6% of total expenditures in 1991, but will come into balance with new construction costs in 1992, with an anticipated 50.2% of the budget.

U.S. gas utilities installed 8,117 miles of replacement pipeline in 1991, including 3,575 miles of replacement mains and 4,542 miles of replacement services. Replacement mileage in 1992 will total 8,073 miles, including 3,688 miles of replacement mains and 4,385 miles of replacement service lines.

Most companies said the relatively warm winter of 1990-91 affected their construction and repair budgets, but others said their expenditures are based on system needs rather than outside factors.

There has been a continuous decline in new business activity in 1991, reflective of the current eco-

New and Replacement Mains and Services, 1989-1992

	1992	19991	1990	1989
New Mains	10,707miles	10,085 miles	9,528 miles	9,266 miles
Replacement Mains	3,688 miles	3,575 miles	5,675 miles	5,249 miles
TOTAL MAINS	14,395 miles	13,660 miles	15,203 miles	14,515 miles
New Services	8,364 miles	7,452 miles	5,888 miles	5,465 miles
Replacement Services	4,385 miles	4,542 miles	3,975 miles	4,309 miles
TOTAL SERVICES	11,749 miles	11,994 miles	9,863 miles	9,774 miles
Total Mileage	26,144 miles	25,654 miles	25,066 miles	24,289 miles

Gas Utility Expenditures, 1989-1992

	1992	1991	1990	1989
New Construction	$2,193,000,000	$1,928,472,000	$1,927,288,000	$1,721,470,000
3Rs	$2,207,136,000	$2,229,306,000	$4,162,662,000	$3,939,606,000

nomic conditions. As a result, our 1992 budget has also been reduced in this area."

"The construction budget was cut by the warmer weather and the poor economy cut back on the new business area. The 1992 budget is following along with a sluggish market."

"Budgets are based on historical data and projected trends. Repair and replacement budgets tend to be more stable than new construction expenditures."

"Warmer weather and a reduction in housing construction due to economic factors had a major effect on our 1992 budget. New construction expenditures were affected more than repair budgets."

"We can only do what has to be done if the money isn't there."

"New construction expenditures are affected because we are going through a 10-year expansion program and our system does not need that much repair."

"We had a milder winter than expected so we were able to perform more repairs."

Many companies have a schedule for replacing a certain percentage of the cast iron pipe in their system every year. Others report they base cast iron main replacements on various factors.

"Replacements are based on leak and broken-main history. Replacement is mostly by direct burial, but we are looking at live insertions."

"We replace cast iron and bare steel pipe with either plastic or coated steel based on operating pressure and size. We have a continuing program to annually replace sections of cast iron pipe, the last of which will be replaced in 1992."

"Mains are replaced with plastic and services are inserted."

"We use 'all around' repair clamps to make cast iron repairs."

"Cast iron repairs are made by shrink sleeves and encapsulation."

"Replacement program is based on size, location, age, leak history and condition of cast iron mains. Repair techniques include replacement, installation of sleeves, belljoint clamps and encapsulation."

"Cast iron repairs are primarily full-encirclement clamps and joint sealing, but internal sealants have also been used."

Plastic pipe in 1991 again accounted for more than than 90% of the distribution piping installed by U.S. gas utilities.

"We are attempting to do away with our low-pressure systems. When they go, so will most of our 277 miles of cast iron main."

Polyethylene pipe is the unquestioned material of choice for new and replacement services, and for mains below 8 in. As it has for several years, PE pipe accounted for more than 91% of the total miles of gas distribution piping installed in 1991, with 23,339 miles. U.S. gas companies installed 11,789 miles of PE main in 1991, 86.3% of the total main mileage during the year. PE accounted for 96.8% of the service lines installed in 1991, or 11,550 miles.

In 1992, U.S. gas distribution companies will install an expected 24,855 miles of plastic pipe, 95% of the total, including 12,552 miles of plastic mains and 12,303 miles of plastic services.

The electrofusion technique of joining plastic gas pipe has gained acceptance over the last several years. Companies reported good experience with electrofusion, particularly for repairs in the ditch and on small (1-in. or smaller) lines.

"We have had good experiences using electrofusion."

"Tapping service tees are installed exclusively by electrofusion. It is also used for repairs and tie-ins."

"We use the Lyall and Inmogaz systems for repairs and tight tie-ins on PE mains, as well as to make transitions between different types of PE. We have had good experience over the roughly 6 years we have been using electrofusion."

"We are pleased with the outcome of electrofusion methods."

"We use both butt-fusion and electrofusion in construction, and have had no problems with either process."

"Electrofusion fittings are installed daily throughout the system and we expect this process to be with us for the foreseeable future. We have not experienced any problems with conventional butt-fusion methods."

"Electrofusion is useful when segments larger than 1.5-in. in diameter must be replaced."

"Electrofusion has proven easiest to work with and reliable. We use it for repairs of mains and services and installation of new services."

"We use electrofusion basically for repairs and in construction where warranted. We have had very good success with electrofusion."

"We are currently using electrofusion on a limited basis, mainly for repair work."

"Electrofusion is excellent for repairs."

"Electrofusion works well in tie-ins and repairs."

"Voltage fluctuations with the generators has been a problem."

In addition to its easy handling, plastic pipe is attractive to many utilities for its low cost and reliable installation. Every company responding said it cost them more on a per-foot basis to install steel pipe than the equivalent diameter of plastic pipe.

"Approximate cost of steel mains is $42 ft; plastic mains, $36 ft."

"Average cost of new steel mains: $25 ft. For new plastic mains, $16 ft."

"Steel pipe installation ranges from $40 ft for a lengthy 1- in. project to $95 ft for a short 8-in. job."

"For 6-in. and smaller pipe, our costs are $9.22 ft for new steel mains installed by contractors and $8.78 ft for new plastic mains. Company-installed main costs are $12.92 ft for new steel and $6.81 ft for new plastic mains."

"Our costs range from $8.75 ft for 2-in. steel to $18 ft for 6-in. steel. **P&GJ**

Methane Leakage In Natural Gas Operations

by Ann Jennervik
Energy Planning & Environmental Issues, AF- Energikonsult Stockholm AB, Stockholm, Sweden

(EDITOR'S NOTE: In Part 1 of this two-part article, Ms. Jennervik describes how the figures for methane emissions have been inflated by uninformed researchers and anti-gas lobbies.)

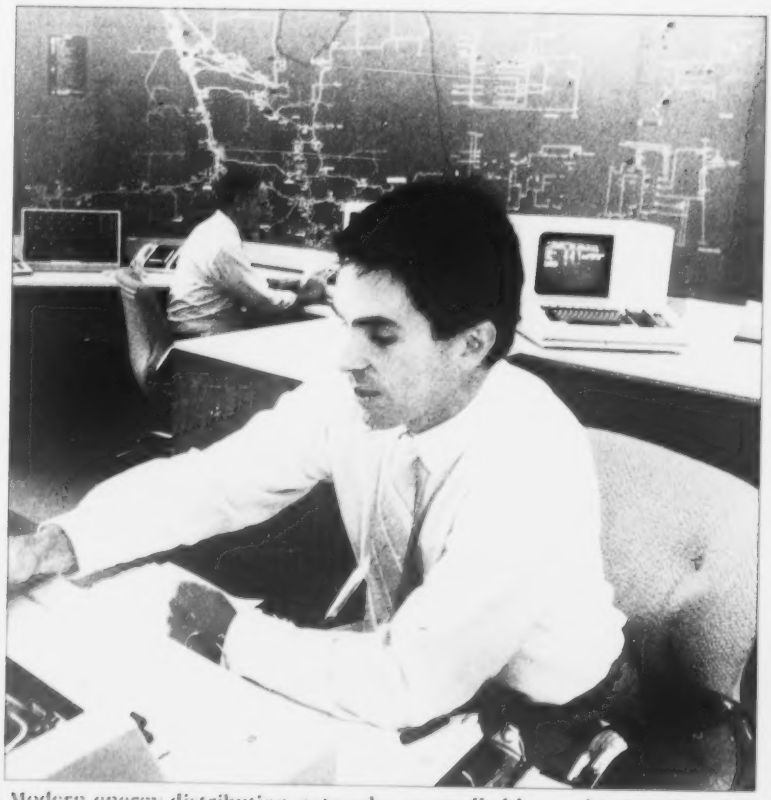
Natural gas is a small but important energy source in Sweden. Plans call for an increase from 1.5% of primary consumption currently to about 10% in 10 years and additional 5% to 10% during the first decade of the 21st century.

The environmental impact is the major concern in the Swedish energy debate today, and especially the greenhouse effect and its contribution to global warming. An intense debate concerning the use of natural gas arose in 1988 that revealed a lack of contact between gas companies and environmental scientists.

SwedeGas carried out two independent studies that summarize methane leakage from natural gas operations, from exploration to distribution. One study focused on worldwide operations with the other focusing on Sweden's existing transmission and distribution system.

These studies showed a total methane leakage of less than one-tenth the 5% to 10% of total volumes often cited by opponents of natural gas use.

- The only significant methane leakage occurs in older distribution networks originally built for manufactured or town gas that now carry natural gas.
- A weighted average of total leakage from natural gas operations worldwide is less than 1% of marketed production.
- For new supplies, the estimate of leakage is 0.05%.



Modern energy distribution networks, controlled by sophisticated equipment and trained professionals such as those found at Consumers Power Co.'s gas control center in Michigan, keep to a minimum any release of methane that could adversely affect the global environment.

Earlier figures quoted in the debate are misinterpreted from industry statistics. In fact, the natural gas industry itself is partly to blame for the lack of connection and exchange of information between researchers and transmission and distribution system operators.

Natural gas can and will play an important part in a clean environment by lowering the emissions of greenhouse gases.

Since 1988, the greenhouse effect and its affect on global warming has been considered a major, if still controversial, environmental problem.

Carbon dioxide is an inevitable result of fossil-fuel combustion. Natural gas has advantages over coal and oil, because its carbon content compared to its hydrogen content is the lowest of the commonly available fuels.

However, natural gas is almost entirely methane, another important greenhouse gas. Each molecule of methane has the effect of five molecules of carbon dioxide. If large amounts of natural gas were in fact seeping out from the system,

it would reduce the advantage of using natural gas instead of coal and increase the greenhouse impact of natural gas vs nuclear power.

As the influence of methane as an infra-red absorbent gas has been more widely recognized, the considerations of methane's greenhouse effect has become vitally important to gas companies around the world.

Methane leakage of 5% to 10% (multiplied by the large affect of methane on the environment) would equalize the fossil fuels. Such figures are often cited during emotional debates by advocates of coal and nuclear energy.

In 1989, the Swedish environmental authorities used the same misinterpreted figures in a proposal for a carbon dioxide- equivalent tax. Swedish energy taxes were to be revised to implement environmental premiums and change the competition among different fuels. As a result, SwedeGas AB, the country's national gas company, needed facts and figures showing the actual levels of leakage to show how absurd the cited loss figures really were. At this time, the only measurement and accurate statistics available were internal company figures.

During that summer, the Alphatania Partnership in London carried out an investigation for SwedeGas involving 41 gas companies and authorities. The aim of the study was to trace potential leakage points along the chain from exploration to the burner tip and determine their causes, potential size, frequency and measurements, so as to minimize them. A separate study was undertaken describing the Swedish gas chain, from platforms and along the pipelines to the country's 8,000 customers.

Disinformation

When incorrect information is spread and used by scientists as well as energy professionals, it is not enough to simply provide new, more accurate information. The correction must explain the earlier information and why it should differ so widely.

The figures regarding methane leakage from gross natural gas operations varied between 4% and 10% of natural gas production. SwedeGas saw that these figures were in conflict with operational experience and had to be either wrong or falsely derived from misunderstood statistics. The figures were drawn from research documents of various sources. The sources were not always quoted or, if quoted, were themselves derived from work by other researchers. The literature seemed to feed upon itself, ignoring obvious operational data. Attempts by Ruhrgas, British Gas and the American Gas Association, among others, to correct these figures had little affect on researchers.

Among the estimates assumed in the literature of total global methane emissions to the atmosphere varied between 225 million tons and 1.2 billion tons. Within these figures, the estimate of leakage from oil and gas operations generally ranged from 20 million to 60 million tons, often calculated from a straight per-

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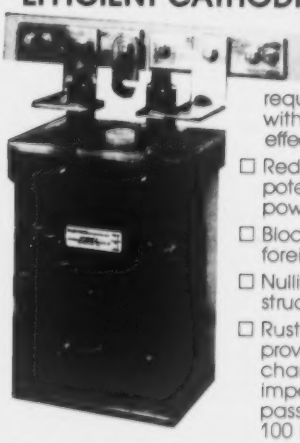

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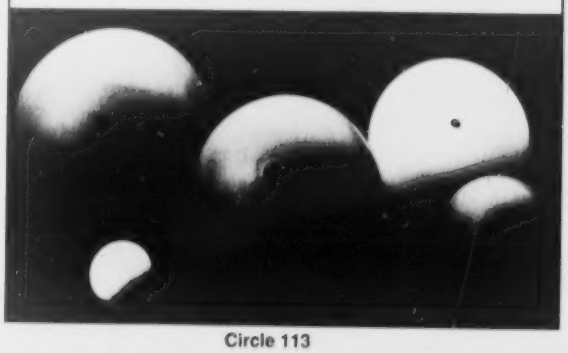

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centage of gross gas production.

There is a strong concentration of natural gas leakage figures of about 30 million to 40 million metric tons per year. The presumed percentage of the total methane emissions arising from oil and gas operations are about 5% to 10%.

However, these figures do not correspond. Thirty to 40 million metric tons are about 2% to 3% of marketed gas production, not 5% to 10%. Generally, no distinction is made between gas and oil operations as sources of methane leakage. In these estimates "natural gas leakage" does not mean leakage from natural gas operations but from oil as well as natural gas operations.

It is not always possible to identify methane leakages from published reports of natural gas production and disposition. The purpose of these statistics is to provide an overview of gas production and consumption, not detailed information about shrinkage and losses. Some methane emissions are in the "flared and vented" category, but this is mostly unmarketed associated gas derived from oil production and should not be included in the gas chain.

In these reports, losses do not simply mean leakage. "Other losses" covers shrinkage at the treatment facilities, including the stripping of natural gas liquids and other gases for commercial use. Gas used as compressor fuel and for other purposes is included in marketed production. Also, recalculations from different volume figures—standard and normal cubic meters and from cubic feet to cubic meters—can be hidden within these figures.

The international survey was carried out by collecting and investigating operational data on methane leakage from the natural gas chain. This is defined as all production, treatment, transportation and delivery of natural gas produced for sale.

The draft was submitted for comment to 41 selected companies and organizations around the world that are closely concerned with natural gas operations. They were asked to submit information and 70% have responded. As a result, the final study information was based on actual measurements, accurate statistics and net calculations from gross figures containing losses other than leakage.

Leakages

There are two important factors that make operating companies eager to diminish methane leakage: safety and commercial reasons.

The escape of inflammable hydrocarbons presents safety hazards, particularly natural gas, which can collect in confined places. It should be noted that natural gas is inherently safer than other light hydrocarbons because of its narrow inflammability limits and speed of dispersion in the atmosphere. When unusable gas occurs, primarily in treatment facilities, it is limited to small amounts for commercial reasons and is almost invariably flared. This causes carbon dioxide but does not release methane.

Safety requirements in natural gas operations are well met by available materials, developed technology and high levels of training. Gas detectors, installed for safety at many facilities handling large volumes of natural gas, can quickly shut off the flow. Accidents where large volumes of natural gas do escape, as in the Piper Alpha platform disaster, are rare and much too small to account for even 0.01% of annual gas consumption.

Involuntary leakages are most frequent in the distribution sector, where large numbers of pipes and installations are involved. They are usually in an urban setting, where excavators can dig into them. In addition, parts of a gas utility system might use materials not suited to the efficient distribution of natural gas. However, even if a rupture occurs only relatively small amounts of gas can escape from these low-pressure installations.

Natural gas is sometimes intentionally vented for safety reasons. Maintenance, repair and replacement of gas facilities—and the connection of new customers—often require the emptying of segments of a pipeline system. The industry practice is to reduce the gas pressure as low as possible before purging the segment to be worked on. Often, the purged gas is flared during repairs.

World Gas Chain Leakage

Country/Region	Marketed Production	Leakage Factor	Total Leakage
U.S	507.22 Bcm 17,909.94 Bcf	0.4%	2.03 Bcm 71.64 Bcf
Canada	62.99 Bcm 2,224.18 Bcf	0.5%	0.03 Bcm 1.11 Bcf
Western Europe	259.36 Bcm 9,158.00 Bcf	0.8%	2.07 Bcm 73.26 Bcf
USSR & Eastern Europe	784.39 Bcm 27,696.81 Bcf	1.0%	7 84 Bcm 276.96 Bcf
Rest of World	345.8 Bcm 12,210.2 Bcf	1.0%	3 46 Bcm 122.10 Bcf
TOTAL	1,959.47 Bcm 69,188.89 Bcf	0.8%	15.43 Bcm 553.51 Bcf
TONNAGE	1.4 billion metric tons		11.02 million metric tons

In Sweden, this type of methane leakage has occurred five times since 1985, for a total release of 415,000 cubic meters (14.6 MMcf), of about 0.04% of total gas flow. This figure will probably be lower after the construction period is completed.

Any loss or inefficient use of natural gas represents costs for the companies involved, which take steps to keep these losses to a minimum.

Gas metering in the distribution sector is not a precise activity. Gas utilities tend to have a metering accuracy that is at best +- 1.0% in practice. Meters are often not corrected for temperature and pressure. There are examples of utilities on occasion recording negative "unaccounted for" annual gas figures for this reason!

Few gas distribution systems are without at least a small amount of gas theft, generally achieved by meter tampering but sometimes by unauthorized and unmetered connections.

Such losses—which are not leakages—are often taken into account by raising the average gas price by 1% or 2%. It is better to have a slightly higher price per unit than tell a gas customer to pay for more gas than the meter shows. Therefore, meters tend to be calibrated on the low side, which shows up as losses.

Results

Actual leakage from natural gas operations is 20% to 10% of the figures usually cited. Instead of 30 million to 40 million metric tons, the figure is actually 11.02 million metric tons.

h one exception, those commenting on the study said or inferred that precise, accurate leakage figures are hard to determine because they are generally small and difficult to differentiate from other marginal influences that make up the "unaccounted-for gas" category. However, the Canadian Gas Association said:

"Distribution systems in Canada are continuously monitored using flame-ionization techniques. From these surveys it is possible to precisely determine the number of leaks in a system and to accurately estimate the amount of gas being released due to leakage. The result is an estimate of 0.03% of all gas sold in Canada."

Even some of the respondents with direct operational data tended to over-estimate leakages from other parts of the gas chain where they are not operationally acquainted.

High losses reported in Eastern European gas systems of up to 40% could imply operating practices are not equal to quality to those of other countries. However, these losses are mostly due to inefficient use of energy and inaccurate or even non-existent metering. **P&GJ**

(NEXT MONTH: Ms. Jennervik details leakage levels for the various parts of the gas chain and in different parts of the world. These articles are based on a paper presented by Ms. Jennervik at the 18th World Gas Conference in Berlin.)

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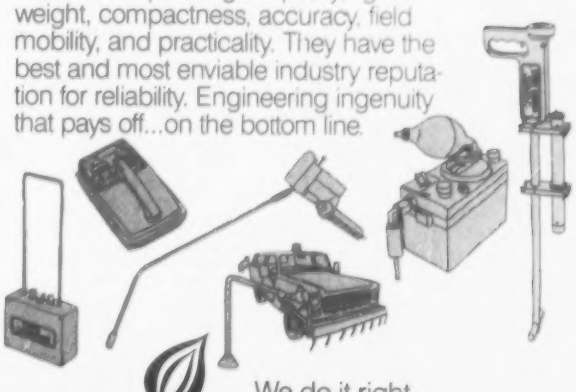

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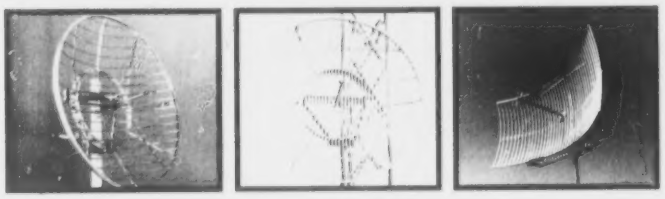

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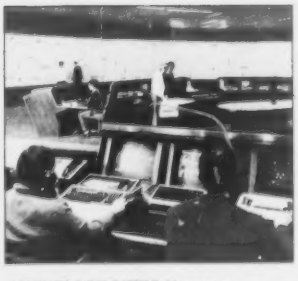
ON THE COVER
Pipeline contractors installed thousands of miles of new energy pipelines in North America during 1991.



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Special Report

U.S. Natural Gas Pipeline Flow And Demand Trends

by Margaret M. Carson, Director of Comparative Analysis, Enron Corp., Houston, Texas

It is no surprise that regional natural gas supply and demand patterns in North America are constantly changing.

A consensus of forecasters agree that the natural gas resource base is larger than envisaged in the early 1980s due to advances in exploration and production technology. In addition, on the demand side more gas will be burned by U.S. power generators to meet growth in electricity. Gas consumption is up in the commercial sector, and natural gas is correctly seen as environmentally protective. But how much more natural gas does the U.S. need?

New pipeline projects are springing up all over the nation— 43 to be exact, with most of them connecting gas deliverability out of basins west of the Mississippi to new markets along the Atlantic and Pacific coasts. Some 3 Bcfd of new, largely interstate pipeline capacity has been brought into service since 1989. Another 3 Bcfd of incremental pipeline capacity is expected to be onstream by 1995.

Because about 3 miles of gathering pipeline are behind every 1 mile of interstate pipeline, options for moving gas from non-traditional sources are growing exponentially with pipeline construction and changes in reserve patterns due to new efficiencies in exploration and development. Of course, these changes add increasing levels of uncertainty about patterns of future U.S. gas flows.

Enron finds that the U.S. gas resource base is ample, with 1,200 Tcf according to the latest estimates. As recently as April 1989 Enron was estimating an 805-Tcf resource base. This includes 158.17 Tcf in proven reserves and 1,031.89 Tcf in total undiscovered resources. Alaskan gas is not included.

Table 1. U.S. Supply/Base Case

	1990	1995	2000
Lower 48 Production	16.9 Tcf 91%	18.0 Tcf 90%	19.0 Tcf 87%
Canadian Exports	1.4 Tcf 8%	1.8 Tcf 9%	2.0 Tcf 9%
LNG/SNG	0.2 Tcf 1%	0.3 Tcf 1%	0.8 Tcf 4%
TOTAL SUPPLY	**18.5 Tcf**	**20.1 Tcf**	**21.8 Tcf**

Proposed Gas Pipeline Projects

Number of Projects	Area	Miles	Cost,$MM	Capacity, MMcfd	CapacityAs Percent Of Total Projects
9	Northeast/East Coast	1,516	$1,800	2,055	13%
7	Gulf Coast	440	$290	2,300	15%
15	Midcontinent/Central	2,020	$1,457	4,393	30%
12	West Coast/Rockies	4,450	$4,398	6,195	42%
43		**8,326**	**$7,945**	**14,943/5.5 Tcfy**	**100%**

Northeast/Eastern Seaboard Pipeline Projects

Proposed In Service	Pipeline	Miles	Cost, $MM	Capacity
11/91	Iroquois	370	$580	575 MMcfd
1992	NiaGara I &II	592	$586	500 MMcfd
9/91	Empire	155	$82	150 MMcfd
11/91	CNG/Transco I	278	$479	370 MMcfd
11/92	CNG Transco II	278	$479	370MMcfd
9/91	CNG I	52	$25	220 MMcfd
1991	Columbia/VA	44	$20	200 MMcfd
7/91	Columbia/Richmond	25	$28	40 MMcfd
9 Projects		**1,516**	**$1,800**	**2,055 MMcfd**

Demand growth is strong, though affected by oil price assumption sensitivities. Highlights in the areas of reserves and production include gains in both categories from fields in the Rockies/Wyoming, San Juan Basin and the Norphlet trends of offshore Alabama. The Midcontinent/Hugoton area has exhibited reserve declines in a period of flat production. In the U.S. Gulf coast offshore, both production and reserves decline over the forecast period, despite strong reserves additions.

Table 1 depicts Lower 48 production in the Enron base case, with approximate market share changes for gas exports to the U.S. and LNG/SNG. Canadian supplies are 2 Tcfy by 2000, up 600 Bcfy from the current 1.4-Tcf levels.

LNG/SNG use grows from the current 200 Bcfy to 800 Bcfy by 2000 in the base case, using the four existing U.S. LNG gasification facilities but without requiring any expansions to U.S. gasifiers. Algerian LNG (and possibly some Nigerian LNG by later in the decade) are the supply sources. Canadian exports and LNG

use could well be higher, depending on policy decisions.

Low oil prices would result in a more modest supply profile, or only 19.2 Tcf by 2000 instead of 21.8 Tcf in the base case. Demand for gas stays relatively flat in the low oil- price case, as fuel-switchable load losses are offset by growth in commercial and electrical generation use.

U.S. regional gas production trends show that traditionally, the preponderance of gas flows from the U.S. Gulf Coast offshore and Midcontinent areas to Northeast and Midwest markets.

In order to access a future 21.8-Tcf U.S. gas market and accommodate growth in deliveries from new gas basins as well as traditional areas, 43 new U.S. and Canadian pipeline projects are in various stages of progress, from awaiting completion to initial regulatory considerations.

Enron recently completed a regional survey of pipeline construction projects. The survey identified 8,526 miles of pipeline with a total capacity of 14.9 Bcfd.

The West Coast Rockies area is by far the most active in the country with proposed new pipeline capacity representing 42% of the total projects on a throughput basis. The average costs of the supply-area pipelines are lower than the market-pull projects serving the Northeast.

Although all the proposed projects are not expected to be built, and others may slip their completion dates by a year or more, at least two out of three of these projects will eventually be completed. This equates to about 4 Tcf of new annual capacity of the 5.5 Tcf as proposed.

The magnitude of these expansions are more than adequate to serve the 3.1 Tcf of market growth forecast by the year 2000 in the Enron base case.

- Two-thirds of the 2 Bcfd of Northeast and East Coast projects will move new Canadian and Midcontinent supplies to markets in the Eastern U.S. The remainder expand access to the U.S. Gulf Coast and offshore supplies for new East Coast markets.
- U.S. Gulf Coast projects total 2.3 Bcfd and largely access growing production volumes from offshore areas for East Coast markets. New projects will also move Black Warrior coal seam gas to South Atlantic markets.
- Midcontinent-Central projects provide access for 4.3 Bcfd of Oklahoma gas to Northeast and Upper Midwest market and provide outlets for Canadian gas, the new Antrim shale gas and other local production.
- West Coast Rockies projects represent up to 6.2 Bcfd from three growing sources of supply competing for markets west of the Rockies: Canadian export volumes, increamental Rockies Wyoming supplies, and rapidly increasing volumes out of the San Juan Basin. About a third of the projects provide for gas to flow both east and west.

The Enron Outlook shows a market of natural gas in the Lower 48 of 21.8 Tcfy, an 8.1-Bcfd increase from 1990.

The forecast assumes GNP growth at an annual rate of 2.6%.

Electricity consumption in the U.S. is expected to grow at an annual rate of 2.2% over the period. Gas

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used for power generation, the main growth market, grows by 1.5 Tcfy over the next 10 years in the Enron base case, from 2.8 Tcf to 4.3 Tcf. In the low oil case, the increase is only 200 Bcfy.

Gas for electric generation sustains significant gains across most regions of the U.S., particularly in the South Atlantic, Mid Atlantic and Southwestern states. Some 28,000 mw of gas-fired combined-cycle capacity will enter service by the year 2000. About half of this capacity will be independent power plants that will be able to meet both power growth needs and compliance with environmental regulations, especially after 1998, due to the Clean Air Act amendments. This is not a great deal of new electric generating capacity – representing only about 3.5% of current U.S. net generating capacity of 800 gigawatts, and about a third of the 90,000 mw of total new generating capacity needed by the year 2000.

Commercial natural gas use will increase 1 Tcf by the year 2000, led by the Pacific and Northeast markets. Compressed natural gas vehicles are included in the commercial use segment, because commercial fleets will lead the market growth due to Clean Air Act fleet mandates in 22 U.S. cities. By the year 2000, the Enron base case includes 500 Bcf of CNG use, the equivalent to about 2.5 million vehicles or

15% of commercial fleets. Commercial gas use gains are strong across the board, particularly following new pipeline capacity additions and interconnects that bring incremental gas to growth markets.

However, residential gas use in the base case is flat to the year 2000, growing just 100 Bcf. Residential gas use is relatively flat for all regions, due to conservation effects of more efficient appliances and competition from electricity that offset modest gas consumption gains. U.S. industrial gas use shows modest gains of 455 Bcf nationally, due to growth in the southwest area.

Enron finds the U.S. gas resource base is ample, according to latest estimates of 1,200 Tcf.

Demand growth is strong, increasing U.S. natural gas use to 21.8 Tcfy by the end of the century, although demand is affected by oil price assumption sensitivities. U.S. gas supplies are price responsive, and the market grows under both the oil price growth and flat oil price scenarios and various pipeline additions.

Planned increases in pipeline capacity appear on track, and are expected to stay on track barring any new tightening of pipeline construction activities by the Federal Energy Regulatory Commission. Capacity is ample to handle the increased gas demand to reach growth markets in the U.S. commercial and electric generation sectors.

Enron is confident that the U.S. gas strategy to bring gas supplies to growth markets by the year 2000 appears to be working. **P&GJ**

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Methane Leakage In Natural Gas Operations

by Ann Jennervik,
Energy Planning & Environmental Issues, AF-Energikonsult Stockholm AB, Stockholm, Sweden

(EDITOR'S NOTE: In Part 1 of this two-part article, Ms. Jennervik described how the figures for methane emissions have been inflated by uninformed researchers and anti-gas lobbies. The initial article presented accurate and much lower figures for methane emissions. In this concluding chapter, she details leakage levels for the various parts of the gas chain and in different parts of the world.)

The world gas industry is efficient in conservation of natural gas within its systems.

As the influence of methane as an infra-red absorbent gas has been more widely recognized, the considerations of methane's greenhouse effect has become vitally important to gas companies around the world.

The industry is universally environmentally conscious. Natural gas transmission and distribution companies want to maintain their image as suppliers of clean fuel. Further reductions in methane leakage—particularly in older distribution systems—can should and will be pursued.

Unfortunately, there has been little exchange of views on methane leakages between commentators on environmental matters and gas companies and organizations. This appears to have led to a misunderstanding of figures available from the industry that has resulted in a misconstruction of the actual size of methane emissions.

There is absolutely no need for the industry to avoid the issue of greenhouse gases. Without industry involvement, the environmental debate concerning fossil fuels could lead to selective interpretation of scientific views and available evidence. Companies and authorities would be presented with confusing, contradictory evidence on which to base policy approaches and regulations.

Exploration Leakage: 0%

Searching for hydrocarbons involves virtually no methane leakage except during very rare blow-out accidents. During a short period, gas discoveries are testing in open flow by flaring and not venting the gas.

Production Leakage: 0.015%

Natural gas is mainly produced as non-associated gas, but about 10% is produced in association with crude oil. Apart from rare accidents, production is a leak-free operation but in some older installations gas is vented rather than flared. In most oil production the gas is flared or reinjected into the formation.

Treatment Leakage: 0.001% to 0.002%

Most gas is treated after production to remove valuable or undesirable components, such as LPG, car-

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Transportation Leakage: 0.001% to 0.13%

Modern materials used in gas pipelines are virtually leak-free. Potential leakage points include flanges and packings, where gas could leak out if the amounts are small enough to avoid detection. Internal figures from system operators all indicate gross leakage figures below 0.01%.

Maintenance, especially repairs, are the main potential leakage points. These could total some hundreds of a percentage point. Normal maintenance, including valve replacements and pigging operations, result in leakage of less than 0.0002%.

Accidents where pipes or other installations are damaged could, calculated by using a statistical frequency of accidents, add another 0.002%.

Transportation of natural gas on LNG carriers is only 3% of world marketed production. LNG boils off at -160°C, and most vessels contain features to curtail, use or re-direct the methane. Most use it as an engine fuel, along with bunker oil. In rare occasions, rough weather causes excessive boil off. Some of this is vented by ships not equipped with flares. This leakage is less than 0.05% of the volumes carried annually.

Natural gas storage is also part of the transportation system. These facilities are in effect an operating gas field with a controlled gas flow, with virtually zero leakage.

Distribution Leakage: Modern systems: 0.05% to 0.4%. Older systems: Maximum of 1%.

Older distribution networks are the only parts of the natural gas chain with significant leakage. These systems, mainly in England and Germany, add many customers each year so old pipe is continually replaced by modern, leak-free pipe.

It is difficult to separate true leakage from metering differences. Elderly town-gas systems, made primarily of cast iron pipe, are reported to have losses of 5% to 10% of gas moved through the system.

Country-By-Country

Austria: Official figures of unaccounted-for gas fluctuate between 0.7% and 0.8%, but these include gas consumed for "own use" and flared gas. (Source: Austria Ferngas)

Denmark: In 1988 the loss of gas in the transmission system was 0.01%. (Source: Dansk Naturgas)

France: No leakage or loss from production; loss from distribution are less than 0.5%. (Source: Gaz de France)

Japan: Unaccounted-for gas accounts for less than 1% which is the difference between gas sendout and sales volume. This includes instrument error, time lag, temperature variations and other factors. Leakage is therefore a much lower figure. (Source: Osaka Gas Co.)

Netherlands: No leakage or discharge of methane in the produc-

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tion phase. Downstream losses are less than 0.4%, virtually all of it from older distribution networks. (Source: Gasunie)

UK: Leakage in the gas chain is just over 1%, maximum. In the total British Gas system, the only significant emissions arise from low-pressure systems and account for less than 1% of throughput. There is a program going on to further reduce low-pressure leakage. As new customers come onstream, older parts of the distribution network are replaced. (Sources: British Gas and UK Department of Energy)

U.S.: Total unaccounted-for and vented-or-flared gas has average below 2.5% of total production over the last decade, but only 0.5% to 1.0% is believed to be actually vented into the atmosphere. Gas losses attributable to leakage or damaged facilities appears to be in the range of 0.2% to 0.5% of production, but there is considerable uncertainty. Venting may represent approximately 0.2% in production, but this is mainly in regard to associated gas. Downstream emissions are in the order of 0.2% to 0.3%. Transmission pipeline leakage accounts for 0.13% of throughput. (Sources: American Gas Association and the Interstate Natural Gas Association of America)

Western Germany: Losses, upstream as well as downstream, are less than 1%. Virtually all are in distribution. A parliamentary committee's assumption that methane totalling 5% of gas consumption escapes is certainly mistaken. Studies by Ruhrgas AG have shown that methane losses between the point of production and the point of use total less than 1% of gas burned by users in the western sector. (Source: Ruhrgas)

Conclusion

Natural gas can play an important role in reducing greenhouse gas emissions.

Replacing fuels with high-carbon content is one approach, but an even more important choice is to use energy more efficiently.

Natural gas has several outstanding attributes in this respect:

- Practically no energy is used or wasted in gas transportation.
- Gas has a higher efficiency in electricity production and significant possibilities exist in combined heat and power applications.
- Direct use of gas in industrial processes could achieve energy savings of 20% to 70%.
- Replacing electricity with gas for heating and cooking purposes would reduce the amount of greenhouse gas emissions to a sixth of the emissions from coal-fired generating plants. **P&GJ**

ABOUT THE AUTHOR

Anne Jennervik, MSc, has been involved in the natural gas business in Sweden for 11 years. Before joining AF- Energikonsult, she was responsible for environmental issues in connection with natural gas at SwedeGas AB, the national gas company.

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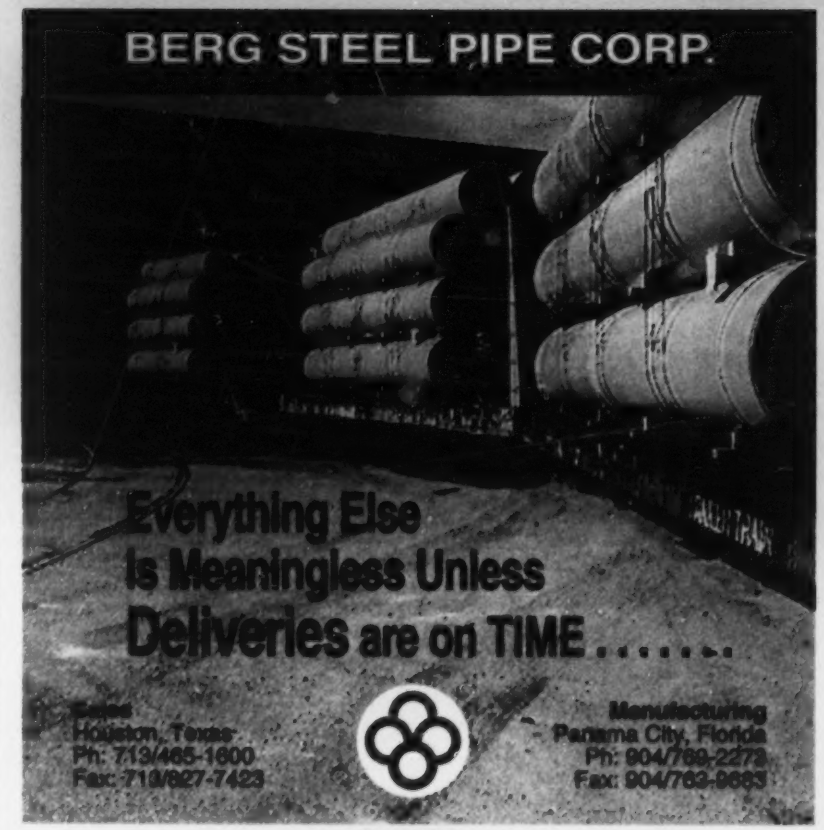

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New pipelines are being built around the world to deliver clean-burning natural gas and other hydrocarbon energies to a demanding marketplace. (Photo courtesy Press Construction Ltd.)

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18 Norway's Zeepipe Project Means More Gas For Europe

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26 Europe's Future Is Natural Gas

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World Pipeline Work Set For Rapid Growth

by P&GJ Staff

International pipeline construction has entered a fast-growth period, accelerated by the new political and economic realities around the world and increasing demand for natural gas, crude oil and refined petroleum products. Many projects are under way or in planning for completion in the mid- to late 1990s in Europe, South America, Asia and the Middle East.

PIPELINE & GAS JOURNAL's projection calls for construction or other work on 30,700 miles of new natural gas, crude oil and refined products pipelines in the 1992-93 period outside Canada and the U.S. These projects will cost an estimated $30 billion-plus.

Natural gas pipelines will comprise most of the mileage, accounting for almost 23,000 miles at an estimated cost of $26.3 billion. Products pipelines, planned or under construction, will add another 5,800 miles at a cost of $2.8 billion. Crude oil pipelines, at a minimum, will total 1,900 new miles at a cost of slightly under $1 billion.

Proposed pipeline projects, mostly those set for completion no earlier than the late 1990s, currently total 13,800 miles, at an estimated cost (1992 dollars) of $11 billion. Both these figures are certain to increase as innovative pipeliners seek new ways to deliver vital hydrocarbon energy to customers that might be thousands of miles from the producing fields.

Major projects under construction or planned include the expansion of the SNAM-ENEL Trans-Mediterranean gas pipeline from Algeria to Italy and Statoil's 681-mile Zeepipe system from the North Sea to Europe, costing some $750 million.

South America should see rapid expansion of its energy transportation grid, with several major pipelines set for construction in Argentina, Bolivia, Brazil and Colombia.

Asia will see substantial activity, with the third phase of Petronas' Peninsular Gas Project, along with large projects in China, Thailand and Indonesia.

In the Middle East, Iran has a major program for new oil and gas pipelines, and Kuwait is rebuilding much of its network.

Increased pipelining activity in Southeast Asia prompted Offshore Pipelines International Ltd. to move its semisubmersible, combination derrick-lay-barge DLB 423 to Malaysia. The refurbished vessel can work in depths to 2,000 ft and lay pipe to 48-in. diameter. The DLB 423 had been working in the Gulf of Mexico on several deep-water projects.

EUROPE

The concerns about a secure supply of gas for Europe have been exacerbated by fears that the long pipelines from Siberia might be vulnerable to political squabbles, and a looming gas shortage.

Ruhrgas AG said gas consumption in Western Europe may go up by 30% over the next 10 years, but a combination of factors might result in a severe gas supply shortage. Speaking at a recent conference in Norway, Dr. Burckhard Bergmann, chief of supply at Ruhrgas, said gas consumption in Western Europe could be 13.28 Tcf/yr by 2005, but predicts supplies will be short by 1.2 Tcf/yr.

Portugal's gasification program is proceeding, with the $600- million Phase 1 set for completion in 1994. Work includes a 250-mile pipeline to deliver Algerian natural gas to a power plant near Braga and a combined-cycle plant outside Lisbon. Portugal will begin importing LNG from Algeria at the rate of 64 Bcfy in 1996.

The Finnish government is considering construction of a $200- million pipeline that would cross the Gulf of Bothnia on its way to Sweden. The 250-mile, 20-in. pipeline would connect Rihimaki, Finland, and Gaevie, Sweden.

Gas demand in the Republic of Ireland will be met by gas delivered through a new $400-million, 177-mile

pipeline from Scotland, set for completion in late 1993. The pipeline consists of a 40-mile onshore pipeline from a connection with British Gas' national transmission system at Moffat, in western Scotland, to the coast at Brighouse Bay. From there, a 137-mile subsea pipeline would cross the Irish Sea to a landfall at Loughshinny, north of Dublin. Bord Gais Eireann's pipeline will have an initial capacity of 100 Bcfy, with a maximum capacity of 175 Bcfy.

British Gas will build a $200-million, 24-in. pipeline to deliver gas to a power plant it recently purchased in Northern Ireland and will convert to natural gas. The line will begin near Castle Douglas in Scotland and cross the ocean on its way to the power plant north of Belfast.

Work will be completed next year on a 435-mile gas pipeline from the Bulgaria-Greece border to Salonica and Athens. The Greek government is also considering a 750-mile gas pipeline from Russia to northern Greece.

In Germany, Wintershall AG is building a 350-mile gas pipeline from Emden to Ludwigshafen for $400 million. The line is to be completed by late 1993. When operational, the Midal Pipeline will be part of an integrated network developed by Wintershall and Russia's Gasprom that includes the Stegal pipeline and a gas storage facility.

European liquid pipeline activities include proposals for a 340-mile, 12-in. products pipeline from Wilhelmshaven, Germany, to Dresden; a 280-mile products pipeline from Hamburg, Germany, to Dresden; a 135-mile, 8-in. products pipeline from Almodovar, Spain, to Merida; a 300-mile, 12-in. products line in France for Spie Capag; and a 225-mile crude oil pipeline from northwestern Czechoslovakia to Germany.

Pipeline work is under way in Spain in anticipation of a 900- mile pipeline link with Algeria via Morocco and the Strait of Gibraltar. Activities include a 300-mile, 26-in. pipeline from Sevilla to Alicante, set for completion by the end of the year.

Activity is high in the North Sea, particularly in the UK and Norwegian sectors.

Statoil is going ahead with Phase II of its $3-billion Zeepipe project. Work will include a 186-mile, 40-in. line from Sleipner to Kollsnes, set for completion in 1996, and a 118-mile, 36-in. pipeline from the Heimdal Field to Kollsnes, set for completion in 1998.

Other Statoil projects include Europipe, a $1.5-billion pipeline from North Sea fields to Germany, and Haltenpipe, a 118-mile, 20-in. gas pipeline from the Haltenbank area to Tjeldebergadden.

International Pipeline Forecast / 1992-93

Type of Pipeline	Mileage	Cost
Natural Gas	22,835	$26.295billion
Refined Products	5,847	$2.788 billion
Crude Oil	1,859	$0.995 billion
TOTAL	30,541	$30.748 billion
FUTURE PROJECTS		
Total Mileage	13,781	$10.940 billion

SOUTH AMERICA

State oil companies in Bolivia and Brazil have agreed on the route of a proposed 1,400-mile, $1.5-billion gas pipeline. Petrobras said the section through Brazil will cost $1.2 billion to build, with Snamprogetti estimating a cost of $294 million for the Bolivian segment operated by Yacimiento Petroliferos. The system will consist of a 350-mile, 20-in. pipeline from producing fields near Santa Cruz, Bolivia, to the Brazilian border at Port Suarez. The pipeline will enter Brazil at Corumba and cross the states of Mato, Gross dul Sol, Sao Paulo, Parana, Santa Caterina and Rio Grande do Sol. The main segment from Santa Cruz to Sao Paulo will total some 1,180 miles, dividing into a new trunk pipeline near Campinas south to Porto Allegro with a branch line to an existing Rio de Janiero-Sao Paulo pipeline. A new 600-mile pipeline will be built from Rio de Janiero to Belo Horizonte.

Petroleos del Peru expects to complete several large gas pipelines in 1993. Work includes 364 miles of 26 in.; 300 miles of 10 in.; and 64 miles of 8 in.

AUSTRALIA

Contracts should be awarded soon for a 118-mile, $A180- million gas pipeline from the Jackson Field in southwest Queensland to Moomba in South Australia. Completion is set for 1994.

ASIA

Petroleum Authority of Thailand has approved construction of a second 500-mile, $705-million gas pipeline paralleling the existing system from fields in the Gulf of Thailand to the country's eastern seaboard. The first phase, set for completion in 1996, consists of a 264-mile, 36-in. subsea pipeline. The second phase includes construction of a 68-mile onshore line to a power plant at Chachoengsao.

The National Pipeline Research Society of Japan has proposed a $20-billion project to build a pipeline from Siberia and Sakhalin Island to Australia. The 16,800-mile pipeline would run through Japan, along the coast of China, to Thailand, Malaysia and Indonesia before terminating at Australia.

ARCO China has awarded a contract for engineering, procurement and project support services on two subsea pipelines to J.P. Kenny's Houston office as part of its $1.2- billion Yancheng gas field development project. The project includes a 480-mile pipeline from the gas field to Hong Kong, and a 60-mile pipeline from the Yancheng Field to Hainan Island.

MIDDLE EAST

Turkey's Botas is considering several extensions to the country's existing gas pipeline system. Proposals include a 620-mile line to the Mediterranean port of Iskenderun, near Syria; a 310-mile pipeline to Izmir on the Aegean; and a 210-mile pipeline along the Black Sea coast, linking Izmit with Eregh..**P&GJ**

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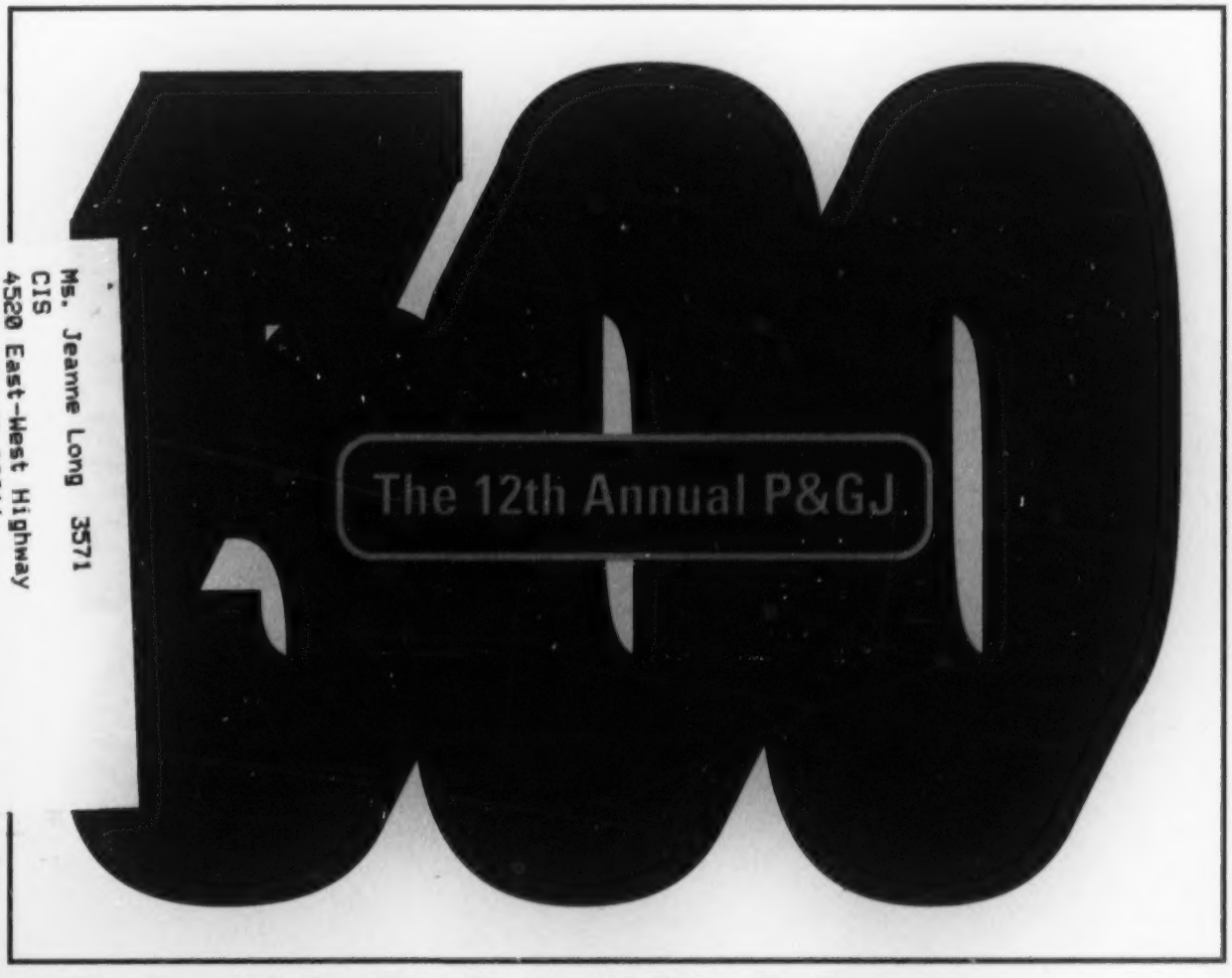

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- **The Top 300 Gas Distribution Utilities By Customers**
- **The Top 100 Natural Gas Pipelines By Miles Of Pipeline**
- **The Top 100 Liquids Pipelines By Total Barrel Throughput**

P&GJ

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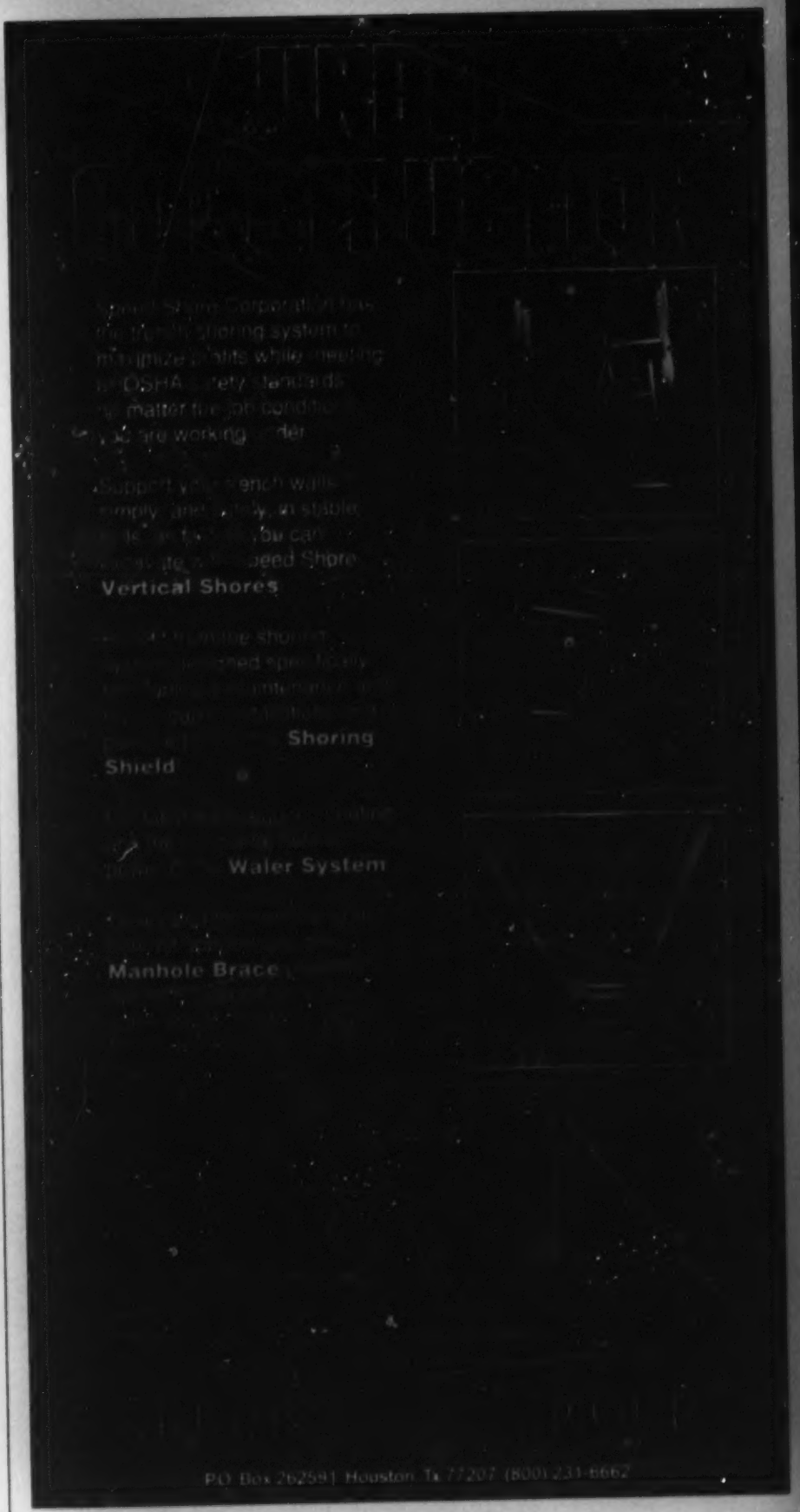

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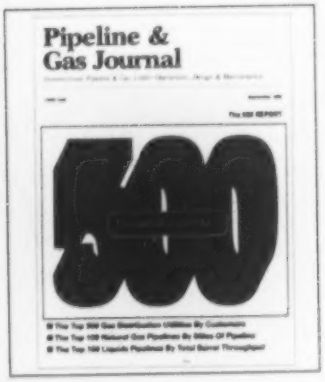
FEATURES



ON THE COVER
Since its debut in 1981, the PIPELINE & GAS JOURNAL 500 Report has provided a unique look at the evolving business of transporting energy through pipelines.

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The Top 100 Natural Gas Pipelines
The Top 100 Liquids Pipelines
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50 Repairing Damaged Casing

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55 MLGW Keeping Pace With RTU Evolution

Memphis Light, Gas & Water has made a determined effort to keep up with the technological advances in remote terminal unit development.

59 Pipe Stabilization In Rugged Terrain

A simple yet effective method has been developed to prevent erosion and washout of a gas pipeline routed through Trinidad's rain forest.

63 Portable Trailer Flares

Texas Eastern Gas Pipeline successfully used portable flares in its extensive project to renovate its aging War Emergency Pipelines.

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Prime movers, compressors and the control of corrosion will be featured in the October issue of PIPELINE & GAS JOURNAL.

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Dimensions Of The 500 Leading U.S. Energy Pipeline Companies

The 12th P&GJ 500 Report

by Jim Watts, Editor

The U.S. energy transmission and distribution system is unparalleled in the world. Operating out of the sight and the perception of the public, this vital network quietly and efficiently delivers the energy needed by a modern economy and society.

For a dozen years, PIPELINE & GAS JOURNAL has been tracking the dimensions of the leading U.S. energy transportation companies in this unique report. The industry has changed over this period in some fundamental aspects. Ways of doing business have changed, and relationships built up over the years have changed. Companies have merged, been spun-off, appeared and disappeared. As the P&GJ 500 Report continues to track the U.S. energy transportation and distribution industry into the 1990s and beyond, the only sure thing is more change.

More than 2 million miles of energy pipelines operating in the U.S. delivered trillions of cubic feet of natural gas and billions of barrels of liquid hydrocarbons to homes, schools, factories, offices, refineries, distribution points and commercial facilities in all 50 states during 1991.

This system cost billions of dollars to build and billions of dollars more every year to operate. It has an unparalleled safety record, because energy pipeline companies are determined to maintain this huge investment in the basic infrastructure of a technological society.

These 500 companies have almost 250,000 employees, including 14,600 at liquids pipeline companies, 72,100 gas pipeline employees and 162,900 gas utility employees.

Gas Utilities

The top 300 gas distribution utilities served a total of 55,150,229 customers, up some 390,000 customers from year-end 1990's total of 54,757,692 customers

Gas company sales were off in 1991 but total gas throughput was up, due to an increase in transportation of customer- owned gas through distribution mains and services. The weather over much of the country was warmer than normal, contributing to the decline in direct sales, as did the prolonged economic slowdown during the year.

Total gas sales in 1991 were 8.656 Tcf, down from 9.058 Tcf in 1990. However, gas moved for others in 1991 totaled 4.814 Tcf, for a total utility throughput during the year of 13.47 Tcf. Total throughput in 1990 was 11.7 Tcf.

Total operating revenues were up in 1991 from 1990, but below 1989's total revenue. The gas utilities reported a total of $46.008 billion in operating revenues, compared to $44.272 billion in 1990 and $50.8 billion in 1989. Operating income totaled $4.053 billion, up from $3.6 billion in 1990 but down from $4.2 billion in 1989.

Additions to plant totaled $4.937 billion in 1991, up $500 million from 1990, as utilities extended and upgraded their distribution network.

Gas Pipelines

Total throughput reported by the top 100 natural gas pipelines was down slightly in 1991, with 43.081 Tcf moved, compared to 46.113 Tcf in 1990 and 40.5 Tcf in 1989. Total gas transported for others was 21.86 Tcf, up from 19.352 Tcf in 1991 and 17.9 Tcf in 1989.

Total gas pipeline mileage was reported at 361,888 miles, up from a total of 355,952 miles of pipeline in 1990. Combined mileage total includes 263,496 of transmission pipeline, 92,593 miles of gathering pipeline and 5,799 miles of pipelines in storage areas. Total net value of the top 300 gas pipelines' system was $35.631 billion. Additions to the plant during 1991 totaled $4.426 billion.

The biggest mover in 1991 was El Paso Natural Gas, which transported slightly more than 5 Tcf through its 17,000-mile system during the 12 months ended Dec. 31, 1991. Of the EPNG total, 1.364 Tcf (27.2%) was transported for others. The largest transporter of third-party gas was Tennessee Gas Pipeline Corp., with 1.419 Tcf (43.8%) of its total 3.241 Tcf being moved under transportation agreements.

The top 100 natural gas pipelines reported operating revenues of $35.631 billion with operating income of $2.927 billion.

Liquids Pipelines

The top 100 liquids pipelines in the U.S. moved a total of 12.481 billion bbl in 1991, up slightly from 12.452 billion bbl in 1990, 12.32 billion bbl in 1989, 12.64 billion bbl in 1988 and 12.36 billion bbl in 1987.

The total includes 7.672 billion bbl of crude oil and 4.810 billion bbl of refined products and natural gas liquids.

The shipments moved through a total of 178,892 miles of pipeline, including 34,936 miles of crude oil gathering lines, 62,310 miles of crude trunk pipelines and 81,646 miles of products trunk pipelines.

Total net plant value of the top 100 pipelines $16.865 billion as of Dec. 31, 1991, with $1.096 billion in additions to plant during the year.

Alyeska Pipeline Service Co., which operates the Trans-Alaska Pipeline System for a consortium of North Slope producers, regained the top position in the liquids pipeline list with movements of 665,000 bbl of crude oil during the year. TAPS throughput was 636.2 million bbl in 1990, 688 million bbl in 1989 and 744 million bbl in 1988.

Colonial Pipeline Co., which took the top spot in 1990 total barrel movements with 665.3 million bbl of products through its system, was second in 1991 with 660,000 bbl moved. Colonial's throughput was 646 million bbl in 1989 and 636 million bbl in 1988.

The top 100 liquids pipeline companies reported total operating revenues of $7.016 billion with operating income of $2.416 billion. **P&GJ**

The Top 10 Liquids Pipelines In Miles Of Pipelines

Rank 91	Rank 92	Name Of Company	Miles of Pipeline
1	1	Amoco Pipeline Co.	11,868
2	2	Mobil Pipe Line Co.	9,339
3	3	Exxon Pipeline Co.	9,312
5	4	Conoco Pipe Line Co.	8,068
4	5	Chevron Pipe Line Co.	7,797
6	6	Shell Pipe Line Corp.	7,207
7	7	Mid-America Pipeline Co.	7,151
8	8	ARCO Transportation Alaska Inc.	6,888
9	9	Williams Pipe Line Co.	6,646
10	10	Texaco Pipeline Inc.	6,355

The Top 10 Gas Pipelines In Additions To Plant

Rank 91	Rank 92	Name Of Company	1991 Additions To Plant ($000)
2	1	Great Lakes Gas Transmission LP	540,724
8	2	ANR Pipeline Co.	535,453
5	3	Transcontinental Gas Pipe Line Corp.	311,500
1	4	Texas Eastern Transmission Corp.	257,890
7	5	Tennessee Gas Pipeline Corp.	242,958
6	6	Natural Gas Pipeline Co. of America	207,360
—	7	El Paso Natural Gas Co.	154,611
9	8	CNG Transmission Corp.	149,556
3	9	Columbia Gas Transmission Co.	143,662
7	10	Arkla Energy Resources	135,200

The Top 10 Gas Utilities In Miles Of Piping

Rank 91	Rank 92	Name Of Company	Miles of Distribution Piping
1	1	Southern California Gas Co.	85,212
2	2	Arkla Inc.	52,675
3	3	Northern Illinois Gas Co.	49,160
4	4	Atlanta Gas Light Co.	47,451
7	5	Consolidated Gas Distribution Companies	45,764
5	6	Pacific Gas & Electric Co.	39,777
8	7	Michigan Consolidated Gas Co.	28,788
6	8	Lone Star Gas Co.	28,685
9	9	Public Service Electric & Gas Co.	27,844
10	10	National Fuel Gas Distribution Corp.	27,770

The Top 10 Gas Utilities In Additions To Plant

Rank 91	Rank 92	Name Of Company	1991 Additions to Plant ($000)
1	1	Pacific Gas & Electric Co.	603,156
2	2	Southern California Gas Co.	306,242
3	3	Atlanta Gas Light Co.	145,666
4	4	Public Service Electric & Gas Co.	140,297
5	5	Northern Illinois Gas Co.	132,170
—	6	Arkla Inc.	119,400
7	7	Michigan Consolidated Gas Co.	117,600
8	8	Brooklyn Union Gas Co.	110,739
6	9	Consolidated Gas Distribution Companies	105,300
—	10	Southwest Gas Corp.	89,964

The Top 10 Liquids Pipelines In Additions To Plant

Rank 91	Rank 92	Name Of Company	1991 Additions To Plant ($000)
1	1	ARCO Pipe Line Co.	296,501
2	2	Phillips Pipe Line Co.	128,917
4	3	BP Pipelines (Alaska) Inc.	101,292
—	4	ARCO Transportation Alaska Inc.	44,428
7	5	Exxon Pipeline Co.	37,679
—	6	Enron Products Pipeline Inc.	30,488
—	7	Ashland Pipe Line Co.	30,174
8	8	Lakehead Pipe Line Co. LP	29,708
5	9	Williams Pipe Line Co.	29,231
—	10	Shell Pipe Line Corp.	26,889

The Top 10 Gas Utilities In Operating Revenues

Rank 91	Rank 92	Name Of Company	1991 Operating Revenues ($000)
2	1	Pacific Gas & Electric Co.	2,951,442
1	2	Southern California Gas Co.	2,930,306
5	3	Consolidated Gas Distribution Companies	2,607,000
6	4	Arkla Inc.	1,771,600
5	5	Northern Illinois Gas Co.	1,548,306
4	6	Public Service Electric & Gas Co.	1,307,849
8	7	Consumers Power Co.	1,056,351
7	8	Michigan Consolidated Gas Co.	1,030,087
[illegible]	9	Brooklyn Union Gas Co.	990,509
—	10	Columbia Gas of Ohio Inc.	981,855

The Top 10 Gas Pipelines In Gas Moved For Others

Rank 91	Rank 92	Name Of Company	Gas Moved For Others MMcf	1991 Gas Throughput, MMcf	% Gas Moved For Others
2	1	Tennessee Gas Pipeline Corp.	1,418,628	3,240,516	43.8%
4	2	El Paso Natural Gas Co.	1,364,174	5,016,514	27.2%
—	3	Northern Natural Gas Co.	1,365,590	1,954,591	69.8%
1	4	Transcontinental Gas Pipe Line Corp.	1,361,000	1,361,400	100.0%
3	5	Natural Gas Pipeline Co. of America	1,314,356	1,618,916	81.2%
5	6	Columbia Gulf Transmission Co.	1,110,742	2,485,335	44.7%
—	7	Southern Natural Gas Co.	999,258	1,228,829	81.3%
—	8	Northwest Pipeline Corp.	815,576	1,706,497	47.8%
—	9	Columbia Gas Transmission Co.	744,815	1,316,227	56.6%
6	10	ANR Pipeline Co.	730,345	970,067	75.3%

The Top 10 Liquids Pipelines In Operating Revenues

Rank 91	Rank 92	Name Of Company	1991 Operating Revenues ($000)
1	1	BP Pipelines (Alaska) Inc.	1,168,029
2	2	Exxon Pipeline Co.	781,110
4	3	Colonial Pipeline Co.	518,567
3	4	ARCO Transportation Alaska Inc.	488,811
5	5	Chevron Pipe Line Co.	225,221
6	6	Lakehead Pipe Line Co. LP	202,331
7	7	Amoco Pipeline Co.	199,947
9	8	Shell Pipe Line Corp.	197,216
8	9	Santa Fe Pacific Pipelines Inc.	193,438
—	10	Phillips Pipe Line Co.	153,521

The Top 10 Gas Pipelines In Operating Revenues

Rank 91	Rank 92	Name Of Company	1991 Operating Revenues ($000)
5	1	Transcontinental Gas Pipe Line Corp.	1,616,800
1	2	Texas Eastern Transmission Corp.	1,571,751
2	3	Natural Gas Pipeline Co. of America	1,541,762
3	4	Arkla Energy Resources	1,218,900
8	5	Enron Intrastate Pipelines	1,118,536
7	6	Northern Natural Gas Co.	1,109,699
6	7	El Paso Natural Gas Co.	1,095,187
—	8	Columbia Gas Transmission Co.	1,021,028
4	9	Tennessee Gas Pipeline Corp.	994,886
—	10	Lone Star Gas Co.	966,166

The Top 10 Liquids Pipelines In Products Deliveries

Rank 91	Rank 92	Name Of Company	1991 Products Deliveries (000) Bbl
1	1	Colonial Pipeline Co.	659,814
2	2	Santa Fe Pacific Pipelines Inc.	321,086
3	3	Buckeye Pipe Line Co. LP	269,141
4	4	Marathon Pipe Line Co.	246,759
5	5	Chevron Pipe Line Co.	241,029
6	6	Phillips Pipe Line Co.	185,681
7	7	Plantation Pipe Line Co.	179,977
8	8	Williams Pipe Line Co.	155,461
10	9	Amoco Pipeline Co.	153,116
—	10	TE Products Pipeline Co. LP	147,247

The Top 10 Gas Utilities In Gas Sold

Rank 91	Rank 92	Name Of Company	1991 Gas Sales, MMcf
1	1	Pacific Gas & Electric Co.	651,569
2	2	Southern California Gas Co.	406,621
5	3	Arkla Inc.	402,000
4	4	Northern Illinois Gas Co.	299,708
6	5	Consolidated Gas Distribution Companies	275,300
7	6	Public Service Electric & Gas Co.	244,018
8	7	Consumers Power Co.	220,951
9	8	Michigan Consolidated Gas Co.	189,292
3	9	Lone Star Gas Co.	182,025
—	10	KPL Gas Service	176,251

The Top 10 Liquids Pipelines In Crude Oil Deliveries

Rank 91	Rank 92	Name Of Company	1991 Crude Oil Deliveries (000) Bbl
1	1	Alyeska Pipeline Service Co.	665,175
2	2	Lakehead Pipe Line Co. LP	442,260
3	3	Shell Pipe Line Corp.	435,991
4	4	Texaco Pipeline Inc.	429,797
6	5	Exxon Pipeline Co.	427,640
7	6	Marathon Pipe Line Co.	361,010
9	7	BP Pipelines (Alaska) Inc.	342,536
8	8	Chevron Pipe Line Co.	330,891
—	9	LOOP Inc.	330,611
10	10	Amoco Pipeline Co.	330,345

The Top 10 Gas Pipelines In Gas Throughput

Rank 91	Rank 92	Name Of Company	Gas Throughput MMcf
1	1	El Paso Natural Gas Co.	5,016,514
3	2	Tennessee Gas Pipeline Corp.	3,240,516
5	3	Columbia Gulf Transmission Co.	2,483,535
2	4	Northern Natural Gas Co.	1,954,591
8	5	Texas Eastern Transmission Corp.	1,833,251
—	6	Northwest Pipeline Corp.	1,706,497
9	7	Natural Gas Pipeline Co. of America	1,618,916
4	8	Transcontinental Gas Pipe Line Corp.	1,361,400
7	9	Columbia Gas Transmission Co.	1,316,227
10	10	Southern Natural Gas Co.	1,228,829

Footnotes

A = Includes The East Ohio Gas Co., Peoples Natural Gas Inc., Hope Gas Inc., River Gas Co., West Ohio Gas

B = Includes Arkansas Louisiana Gas Co., Entex and Minnegasco

C = Formerly reported as Louisiana Gas Service

D = Formerly reported as Norco Gas & Fuel and Dixie gas Co.

E = Fiscal Year ended 4/30/91

F = FY ended 6/30/91

G = FY ended 7/31/91

H = FY ended 8/31/91

I = FY ended 9/30/91

J = FY ended 10/31/91

K = Gas volumes reported in dekatherms

The 300 Leading Gas Distribution Utilities

The P&GJ 500 . . . dimensions of the pipeline energy business

Rank 91	Rank 92	Name Of Company	Number Of Customers	1991 Gas Sales MMcf	1991 Financial: Operating Revenues $(000)	1991 Financial: Operating Income $(000)	Gas Plant Net Value $(000) 12-31-91	1991 Additions To Plant $(000)	Miles Of Mains	Miles Of Services
1	1	Southern California Gas Co.[a]	4,648,597	406,621	2,930,506	291,355	5,000,264	506,242	41,440	41,772
2	2	Pacific Gas & Electric Co.	3,500,172	651,569	2,951,442	504,597	2,755,545	603,156	5,356	34,421
3	3	Arkla Inc.[b]	2,675,502	402,000	1,771,600	159,100	1,167,461	119,400	52,675	0
4	4	Consolidated Gas Distribution Companies[c]	1,738,098	273,300	2,607,000	230,100	1,390,000	105,300	27,519	18,245
5	5	Northern Illinois Gas Co.	1,713,101	299,708	1,338,306	129,388	1,458,760	132,170	26,431	22,729
6	6	Public Service Electric & Gas Co.	1,519,000	244,018	1,307,849	115,259	1,176,456	140,297	14,122	13,723
7	7	Consumers Power Co.	1,382,179	220,931	1,056,351	64,843	873,074	53,144	21,356	0
8	8	Lone Star Gas Co.	1,246,625	182,025	966,166	82,787	405,332	22,937	22,279	6,406
9	9	Atlanta Gas Light Co.	1,218,506	163,646	963,864	94,547	1,123,426	143,666	26,623	20,808
10	10	Columbia Gas of Ohio Inc.	1,198,142	171,254	981,835	50,918	582,703	51,872	16,173	0
12	11	Michigan Consolidated Gas Co.	1,112,772	189,292	1,030,087	66,639	909,190	117,600	13,966	14,822
11	12	Brooklyn Union Gas Co.	1,111,337	111,057	990,509	95,496	1,062,060	110,739	5,916	5,388
13	13	KPL Gas Service	1,067,840	176,231	686,048	24,120	633,030	81,991	17,025	7,379
14	14	Consolidated Edison Co. of New York Inc.[a]	1,027,933	92,552	680,175	85,555	1,056,289	87,973	4,146	0
15	15	Public Service Co. of Colorado	878,579	159,866	587,609	43,621	568,832	79,310	13,752	0
17	16	Southwest Gas Corp.[a]	870,322	88,525	514,948	55,866	828,424	89,964	17,069	10,344
16	17	Peoples Gas Light & Coke Co.[f]	843,580	151,269	975,621	94,562	1,043,750	83,342	4,016	5,282
18	18	National Fuel Gas Distribution Corp.	715,806	115,599	704,495	50,346	685,570	41,483	14,335	13,435
21	19	Washington Gas Light Co.	681,412	126,914	705,293	72,968	810,365	78,580	8,220	9,359
20	20	Oklahoma Natural Gas Co.[g]	679,325	154,583	564,226	39,760	380,611	55,995	12,865	1,593
19	21	San Diego Gas & Electric Co.	673,376	93,955	429,415	37,371	344,765	44,675	6,513	5,129
23	22	Laclede Gas Co.[f]	599,179	85,330	436,001	34,084	348,304	43,784	6,905	6,536
22	23	Northern Indiana Public Service Co.	594,927	107,515	625,159	67,692	624,256	41,087	12,176	11,443
24	24	UtiliCorp United Inc.	582,000	120,080	496,000	41,500	530,100	68,400	2,663	15,275
25	25	Atmos Energy Corp.	541,000	86,756	346,613	19,294	207,519	29,696	16,755	2,800
26	26	Philadelphia Gas Works	530,287	70,311	459,481	58,392	675,717	51,987	3,012	3,678
27	27	Baltimore Gas & Electric Co.	520,031	60,378	358,195	30,944	421,098	49,933	4,481	2,533
28	28	Mountain Fuel Supply Co.	515,825	37,742	416,759	54,887	438,168	36,984	9,233	6,124
29	29	Boston Gas Co.	501,228	103,478	554,470	47,623	477,792	40,670	5,704	4,195
30	30	Niagara Mohawk Power Corp.	476,570	71,729	475,225	36,513	582,687	61,677	6,948	4,832
31	31	Wisconsin Gas Co.	460,549	96,605	474,701	29,785	139,349	34,473	6,979	0
34	32	Piedmont Natural Gas Co.	440,000	80,880	411,548	40,078	537,874	68,803	10,067	8,615
32	33	Long Island Lighting Co.	436,853	52,963	351,161	17,188	565,535	62,734	6,132	4,850
43	34	Indiana Gas Co. Inc.	425,078	82,114	395,772	38,094	447,982	49,448	9,224	6,854
33	35	Alabama Gas Corp.[f]	414,218	44,510	309,127	19,209	205,874	18,565	8,200	8,800
36	36	Cincinnati Gas & Electric Co.	407,933	72,066	370,705	16,190	450,399	66,704	5,014	1,123
37	37	Illinois Power Co.	401,763	57,803	288,165	24,095	308,199	24,298	7,519	4,745
35	38	Southern Union Gas Co.	392,800	43,679	189,861	3,487	309,289	46,800	6,758	3,303
41	39	Washington Natural Gas Co.[f]	382,446	84,182	311,052	46,656	547,052	88,308	7,869	8,141
39	40	Northern States Power Co.	369,800	79,419	357,920	24,013	447,400	30,300	6,229	4,908
38	41	Midwest Gas	362,514	64,251	292,291	16,256	254,877	15,593	6,217	5,356
40	42	Columbia Gas of Pennsylvania	358,074	50,807	345,900	36,188	298,482	18,427	6,464	0
42	43	Philadelphia Electric Co.	353,121	49,195	356,013	51,383	544,074	46,788	5,081	3,984
44	44	Gas Co. of New Mexico	345,678	56,541	302,104	24,913	250,867	20,468	2,044	1,680
45	45	Northwest Natural Gas Co.	319,785	45,825	296,281	44,353	485,260	25,824	8,875	4,814
47	46	New Jersey Natural Gas Co.[f]	314,508	50,540	254,877	30,148	430,233	44,572	5,280	4,601
48	47	City Public Service of San Antonio	287,325	25,631	110,801	22,637	158,527	11,965	3,855	3,215
49	48	Dayton Power & Light Co.	281,390	52,657	201,038	0	130,535	5,874	4,368	799
50	49	Equitable Gas Co.	279,474	36,688	312,013	31,861	380,591	25,867	3,351	762
53	50	Wisconsin Natural Gas Co.	271,718	43,499	293,119	18,279	198,548	20,892	4,972	3,569

The 300 Leading Gas Distribution Utilities

The P&GJ 500 . . . dimensions of the pipeline energy business

Rank 91	Rank 92	Name Of Company	Number Of Customers	1991 Gas Sales MMcf	1991 Financial: Operating Revenues $(000)	1991 Financial: Operating Income $(000)	Gas Plant Net Value $(000) 12-31-91	1991 Additions To Plant $(000)	Miles Of Mains	Miles Of Services
55	51	Bay State Gas Co.	270,342	58,967	344,098	29,248	372,667	54,046	4,888	3,011
52	52	Memphis Light, Gas & Water Div.	266,942	57,830	162,920	18,734	156,132	20,522	3,546	2,233
51	53	United Cities Gas Co.	265,534	46,301	220,396	13,522	206,352	30,042	6,601	4,652
54	54	Rochester Gas & Electric Corp.	264,844	35,237	235,728	16,708	224,923	13,268	4,070	3,226
56	55	Louisville Gas & Electric Co.	249,281	40,621	166,291	10,455	137,755	13,783	3,397	1,330
59	56	Public Service Co. of N.C. Inc.	243,975	42,887	289,399	27,442	294,156	29,089	5,083	3,342
57	57	Citizens Gas & Coke Utility	240,470	36,717	186,914	5,702	340,690	39,664	3,309	4,446
58	58	Citizens Utilities/Louisiana[c]	239,298	17,601	99,113	8,429	112,640	5,722	4,282	3,056
60	59	Mississippi Valley Gas Co.	235,971	43,218	160,878	6,603	75,124	4,523	4,651	3,810
61	60	Iowa-Illinois Gas & Electric Co.	234,829	41,012	180,960	7,039	221,198	11,398	3,937	2,735
62	61	Elizabethtown Gas Co.	229,000	53,861	238,439	17,835	227,906	17,610	2,523	1,496
63	62	Commonwealth Gas Co.	227,395	41,899	258,235	12,922	220,692	17,130	2,686	1,856
64	63	UGI Corp.	223,682	33,713	251,851	33,427	327,536	38,294	3,710	2,297
65	64	South Jersey Gas Co.	223,588	47,249	220,070	25,149	319,918	32,222	4,627	3,778
46	65	K N Energy Inc.	220,000	78,300	355,563	50,612	513,948	51,638	3,407	1,105
66	66	South Carolina Electric & Gas Co.	210,756	24,176	150,788	13,290	176,589	17,562	4,921	4,814
67	67	Mountaineer Gas Co.	198,015	55,669	158,769	6,286	162,323	6,564	3,659	565
68	68	Central Illinois Light Co.	188,438	24,769	158,462	12,591	173,478	12,761	2,615	2,948
71	69	Wisconsin Public Service Corp.	180,388	33,114	152,222	7,762	81,576	8,125	3,195	2,570
69	70	Montana-Dakota Utilities Co.	179,474	27,315	150,634	6,160	59,616	5,774	3,648	2,395
72	71	Peoples Gas System Inc.	179,187	39,592	202,421	17,273	195,324	30,393	5,189	3,182
70	72	Yankee Gas Services Co.	177,341	33,057	222,716	18,273	277,424	24,399	2,613	2,087
73	73	Virginia Natural Gas	168,371	21,125	121,901	12,545	260,753	79,089	3,134	3,265
88	74	IES Industries	164,078	30,940	146,237	65	113,670	21,100	2,121	1,950
74	75	Central Illinois Public Serv. Co.	158,566	19,974	117,583	5,348	179,165	14,878	2,987	2,093
76	76	Providence Gas Co.[1]	155,060	25,700	174,110	9,922	154,094	9,013	2,198	1,764
75	77	New Orleans Public Service Inc.	153,881	17,385	77,082	(473)	59,237	2,820	1,535	1,106
78	78	Metropolitan Utilities District of Omaha	151,463	30,605	113,341	2,329	102,815	9,259	1,923	0
79	79	Arkansas Western Gas Co.	151,167	27,013	121,302	14,027	90,027	7,856	3,900	1,500
77	80	Southern Connecticut Gas Co.[1]	150,656	21,836	178,830	19,910	198,605	20,331	2,808	2,198
80	81	Long Beach Gas Dept.	146,927	25,736	130,109	0	37,884	1,445	908	930
81	82	New York State Electric & Gas Corp.	146,037	24,996	162,271	14,495	154,613	14,939	4,102	460
82	83	Connecticut Natural Gas Corp.	140,618	31,555	202,021	19,415	173,121	19,450	1,772	1,616
83	84	Commonwealth Gas Services Inc.	138,175	19,565	121,553	10,053	138,696	18,650	3,192	0
84	85	Pennsylvania Gas & Water Co.	129,082	24,377	135,185	17,629	449,229	14,127	2,042	1,194
86	86	Michigan Gas Utilities Co.	125,899	22,930	107,148	10,344	105,161	7,808	2,856	2,362
87	87	Columbia Gas Of Kentucky Inc.	125,092	16,765	102,607	10,220	81,375	7,062	2,067	0
85	88	Wisconsin Power & Light Corp.	124,698	21,435	110,423	10,527	96,929	8,389	2,345	0
89	89	Colonial Gas Co.	123,210	18,320	157,719	16,422	362,756	17,314	2,515	0
90	90	Colorado Springs Utilities	119,760	17,174	76,171	8,834	96,888	6,996	1,593	631
91	91	North Shore Gas Co.	118,279	24,439	130,801	12,937	125,409	11,673	1,853	1,843
93	92	Montana Power Co.	116,977	23,895	108,542	19,733	240,409	15,087	2,577	2,433
95	93	North Carolina Natural Gas Corp.[1]	116,635	29,294	127,640	11,935	129,337	21,877	3,240	2,682
92	94	Intermountain Gas Industries Inc.	113,914	35,153	74,219	9,589	73,987	7,217	3,314	2,153
94	95	Union Electric Co.	112,170	13,715	80,310	4,689	86,786	9,441	2,499	1,555
96	96	Cascade Natural Gas Corp.	108,555	47,740	120,515	16,301	136,945	13,904	3,372	1,887
97	97	Orange & Rockland Utilities Inc.	106,854	30,325	122,687	10,979	110,869	13,557	1,646	1,404
98	98	Southern Indiana Gas & Elect. Co.	96,916	14,771	58,695	18,001	58,058	7,702	2,543	1,855
101	99	Greeley Gas Co.	92,897	14,757	62,127	2,775	4,976	4,200	3,475	1,334
99	100	Washington Water Power Co.	91,281	17,538	98,970	9,377	77,911	8,426	2,328	1,786

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Rank 91	Rank 92	Name Of Company	Number Of Customers	1991 Gas Sales MMcf	1991 Financial: Operating Revenues $(000)	1991 Financial: Operating Income $(000)	Gas Plant Net Value $(000) 12-31-91	1991 Additions To Plant $(000)	Miles Of Mains	Miles Of Services
100	101	City Gas of Florida	91,225	7,467	40,222	3,616	69,049	5,554	2,075	1,158
102	102	Madison Gas & Electric Co.	90,112	16,629	85,822	8,720	75,288	2,556	1,591	1,294
103	103	Mobile Gas Service Corp.	88,427	8,014	45,109	4,725	55,559	4,564	1,569	1,856
104	104	Delmarva Power & Light Co.	87,551	15,519	71,222	7,115	112,421	18,302	1,286	959
105	105	Michigan Gas Co.	84,174	17,174	75,500	1,614	92,755	1,477	1,788	1,417
106	**106**	**Gulf States Utilities Co.**	**83,385**	**6,922**	**31,858**	**968**	**20,178**	**511**	**1,435**	**1,250**
107	**107**	**Enstar Natural Gas Co.**	**82,858**	**40,041**	**129,016**	**27,067**	**174,636**	**7,802**	**1,570**	**1,215**
108	**108**	**Southeastern Michigan Gas Co.**	**81,600**	**13,274**	**60,200**	**5,780**	**67,573**	**6,505**	**1,582**	**0**
110	**109**	**Westpac Utilities**	**80,157**	**10,623**	**50,397**	**4,545**	**71,678**	**6,034**	**857**	**0**
109	**110**	**Richmond Public Utilities[7]**	**79,800**	**14,186**	**81,509**	**11,626**	**104,152**	**15,993**	**1,280**	**1,261**
112	111	Rio Grande Valley Gas Co.	72,227	5,642	27,226	115	20,445	2,026	1,525	266
111	112	CP National Corp.	71,503	8,476	42,909	6,799	52,942	5,659	1,522	907
114	113	Northwestern Public Service Co.	68,556	13,886	54,912	2,810	25,422	4,756	1,247	1,106
115	114	Gasco Inc.	67,457	5,401	76,924	5,480	75,857	5,590	621	548
116	115	Union Light, Heat & Power Co.	65,508	9,898	49,756	7,229	65,702	9,711	900	173
117	**116**	**Springfield City Utilities[7]**	**63,379**	**10,929**	**40,425**	**2,073**	**43,388**	**8,211**	**929**	**894**
0	**117**	**Citizens Utilities/Arizona Division**	**63,354**	**1,082**	**4,749**	**567**	**46,515**	**0**	**1,271**	**310**
119	**118**	**EnergyNorth Inc.[3]**	**59,753**	**9,308**	**63,915**	**738**	**85,025**	**8,349**	**942**	**522**
122	**119**	**Central Hudson Gas & Electric Corp.**	**57,247**	**10,985**	**70,616**	**5,195**	**72,171**	**5,379**	**873**	**580**
121	**120**	**Corpus Christi Gas Division, City of[6]**	**55,854**	**4,230**	**21,359**	**2,389**	**19,896**	**150**	**1,140**	**244**
123	121	T. W. Phillips Gas & Oil Co.	54,195	19,026	79,196	7,774	93,487	75,532	5,125	0
124	122	Valley Resources Inc.[11]	52,433	6,859	44,775	2,645	51,981	2,543	539	366
125	123	Interstate Power Co.	46,812	16,562	54,574	2,849	51,600	4,460	847	0
128	124	Roanoke Gas Co.[1]	46,462	8,702	45,265	5,167	28,055	2,458	972	1,064
127	125	Wisconsin Southern Gas Co. Inc.	46,173	7,714	40,684	818	24,123	3,459	1,221	855
126	**126**	**Fall River Gas Co.**	**45,792**	**6,725**	**39,996**	**1,925**	**26,923**	**3,081**	**694**	**570**
129	**127**	**Wisconsin Fuel & Light Co.**	**43,241**	**9,318**	**44,473**	**2,841**	**21,077**	**2,592**	**965**	**611**
130	**128**	**Energy Services of Pensacola**	**42,604**	**3,094**	**25,566**	**0**	**0**	**0**	**1,122**	**742**
131	**129**	**Chattanooga Gas Co.[1]**	**42,515**	**10,908**	**50,229**	**4,825**	**69,211**	**9,446**	**1,158**	**934**
120	**130**	**Arkansas Oklahoma Gas Corp.**	**40,082**	**11,698**	**43,602**	**1,851**	**45,645**	**5,208**	**1,371**	**372**
134	131	Knoxville Utilities Board	39,393	7,767	40,383	2,001	65,891	7,874	1,125	744
132	132	Iowa Southern Utilities Co.	38,618	7,189	29,162	942	28,285	3,914	699	565
133	133	Essex County Gas Co.	38,068	5,285	37,346	4,565	55,656	3,423	670	383
135	134	Austell Natural Gas System	36,117	3,553	19,260	0	25,161	0	717	659
136	135	Ohio Gas Co.	35,511	5,565	33,489	0	0	0	915	625
137	**136**	**Florida Public Utilities Co.**	**33,857**	**5,197**	**23,814**	**1,547**	**23,249**	**2,270**	**920**	**0**
139	**137**	**Battle Creek Gas Co.**	**33,472**	**5,497**	**32,621**	**3,727**	**33,242**	**2,899**	**573**	**0**
140	**138**	**North Penn Gas Co.**	**33,271**	**5,222**	**37,211**	**4,260**	**48,814**	**3,855**	**1,724**	**548**
147	**139**	**Delta Natural Gas Co. Inc.[7]**	**31,739**	**3,558**	**25,772**	**3,268**	**43,553**	**4,694**	**1,194**	**0**
142	**140**	**Southeast Alabama Gas District**	**31,390**	**9,563**	**34,949**	**4,395**	**0**	**1,500**	**926**	**1,056**
141	141	Berkshire Gas Co.	30,893	6,059	43,144	6,774	85,393	1,979	631	381
144	142	Huntsville Utilities Gas System[1]	30,846	5,239	21,961	0	46,799	2,552	783	467
143	143	Penn Fuel Gas Inc.	30,259	11,540	55,429	0	0	0	988	215
145	144	Columbia Gas of Maryland Inc.	30,179	4,275	28,479	3,512	29,173	2,107	565	0
146	145	Kokomo Gas & Fuel Co.	29,881	7,372	26,845	0	0	0	643	509
148	**146**	**Chesapeake Utilities Corp.**	**29,448**	**9,909**	**4,071**	**3,332**	**30,890**	**3,342**	**437**	**386**
150	**147**	**Ohio Valley Gas Corp.**	**26,534**	**5,433**	**17,675**	**625**	**13,449**	**1,447**	**740**	**602**
151	**148**	**Northern Indiana Fuel & Light Co. Inc.**	**26,129**	**4,159**	**29,785**	**1,932**	**22,672**	**1,351**	**694**	**502**
152	**149**	**Cheyenne Light Fuel & Power Co.**	**25,336**	**5,210**	**14,427**	**2,015**	**11,581**	**774**	**465**	**0**
154	**150**	**West Florida Natural Gas Co.**	**25,300**	**2,675**	**14,079**	**0**	**0**	**0**	**693**	**561**

The 300 Leading Gas Distribution Utilities

The P&GJ 500 . . . dimensions of the pipeline energy business

Rank 91	Rank 92	Name Of Company	Number Of Customers	1991 Gas Sales MMcf	1991 Financial: Operating Revenues $(000)	1991 Financial: Operating Income $(000)	Gas Plant Net Value $(000) 12-31-91	1991 Additions To Plant $(000)	Miles Of Mains	Miles Of Services
153	151	Middle Tennessee Natural Gas Util. Dist.	24,961	4,078	18,353	159	37,883	9,253	1,241	792
157	152	Okaloosa County Gas District[i]	23,911	2,577	14,012	1,469	17,010	3,202	757	674
155	153	Palo Alto Utilities, City of[g]	23,066	3,716	17,207	1,527	20,961	2,562	181	132
156	154	Mesa, City of	23,002	2,634	17,958	5,814	18,505	573	661	268
158	155	Hamilton Municipal Utilities	22,403	3,017	16,511	0	18,482	3,265	226	262
60	156	National Gas & Oil Corp.	22,186	9,966	50,634	2,671	31,435	3,257	710	44
217	157	Duluth Dept. of Water & Gas, City of	21,772	5,317	22,501	2,104	30,893	1,250	423	210
162	158	Vermont Gas Systems, Inc.	21,265	6,766	51,051	1,846	25,910	5,294	301	239
161	159	Wilmot Gas & Oil Co.[f]	21,073	3,660	12,325	815	7,976	1,332	715	0
167	160	Jackson Utility Division	19,603	3,504	14,912	1,300	21,179	1,085	436	357
163	161	Las Cruces Gas System, City of	19,145	1,957	8,844	0	0	0	404	168
165	162	Albany Water, Gas & Light Commission	18,933	1,695	10,319	2,356	2,186	164	371	458
164	163	Gainesville Gas Co.	18,922	3,118	12,443	806	9,061	0	392	243
149	164	Great Falls Gas Co.	18,587	4,397	16,764	850	8,168	116	382	303
169	165	Pennsylvania & Southern Gas Co.	18,582	6,539	27,307	2,883	10,803	706	479	392
171	166	Ft. Hill Natural Gas Authority	18,261	4,671	18,863	0	0	0	560	485
168	167	Great Plains Natural Gas Co.	18,076	4,132	17,666	851	8,052	643	376	297
170	168	Alexandria Gas Dept., City of	17,890	2,028	11,540	0	0	0	347	135
173	169	Trussville Utilities Board	16,463	2,093	12,479	2,350	31,980	888	352	252
175	170	Danville Water Gas & Electric Dept.	16,052	4,968	20,845	3,096	597	266	197	195
174	171	Fitchburg Gas & Electric Light Co.	15,775	2,734	17,325	1,788	21,266	1,774	303	171
205	172	Natural Gas Co. of Louisiana[b]	15,015	1,378	5,970	322	5,296	326	431	82
0	173	Houma Municipal Gas System	14,053	9,105	3,596	0	0	0	315	66
178	174	Richmond Gas Corp.	13,701	3,822	15,155	1,425	12,122	1,565	232	168
179	175	Marshall County Gas District	13,443	4,001	14,840	536	14,153	296	448	780
180	176	Charlottesville Public Works, City of	13,361	2	12,100	0	0	400	261	237
181	177	Lancaster Municipal Gas Co.	13,308	2,154	9,226	0	0	0	302	0
187	178	Lawrenceville Natural Gas System	13,226	1,422	0	0	0	0	274	234
195	179	Florence Gas Dept., City of	13,000	1,839	0	0	0	0	575	331
182	180	Corning Natural Gas Corp.	12,994	2,546	14,822	647	11,827	5,080	370	98
183	181	NE Okla. Public Facilities Authority	12,457	985	4,969	1,372	700	0	112	421
190	182	Greenwood Commission of Public Works	12,268	7,946	10,354	2,052	8,638	333	329	224
184	183	Midwest Energy Inc.	12,085	3,677	13,287	272	3,124	229	879	150
185	184	Warner Robins, City of	12,007	2,997	8,374	7	5,362	0	194	115
186	185	St. Lawrence Gas Co.	12,004	8,308	28,788	1,457	10,007	856	266	0
188	186	Citizens Gas Fuel Co.	12,000	2,616	13,061	1,400	9,087	499	307	215
191	187	Midwest Natural Gas Corp.	11,953	1,819	8,699	780	8,575	1,232	401	183
199	188	Rocky Mount, City of	11,665	2,470	0	0	0	0	175	216
196	189	Clearwater Gas System[f]	11,549	1,331	9,646	1,196	11,926	1,845	433	246
0	190	Citizens Utilities/Colorado Division	11,410	1,556	7,209	453	5,821	730	242	40
192	191	Hobbs Gas Co.	11,263	1,312	5,685	0	0	0	0	0
193	192	Holyoke Gas & Electric Dept., City of	11,068	2,401	11,744	291	7,219	650	153	78
194	193	Clinton-Newberry Gas Authority	11,000	2,286	11,000	0	20,000	1,000	1,500	500
198	194	Hastings Utilities	10,019	17	7,397	287	1,049	0	136	162
197	195	Cedar Falls Utilities	9,918	1,670	7,294	789	8,684	480	157	191
63	196	Aurora Utilities	9,656	1,857	7,946	0	0	0	135	111
202	197	Illinois Gas Co.	9,617	1,275	6,800	579	4,705	435	301	127
209	198	Superior Water, Light & Power Co.	9,560	2,177	8,337	232	8,287	357	131	127
201	199	Tallahassee Municipal Gas System	9,509	1,463	10,295	2,798	13,395	2,213	330	217
204	200	Henderson Municipal Gas System[f]	9,324	2,044	8,166	421	4,995	515	175	106

The 300 Leading Gas Distribution Utilities

The P&GJ 500 . . . dimensions of the pipeline energy business

Rank 91	Rank 92	Name Of Company	Number Of Customers	1991 Gas Sales MMcf	1991 Financial Operating Revenues $(000)	1991 Financial Operating Income $(000)	Gas Plant Net Value $(000) 12-31-91	1991 Additions To Plant $(000)	Miles Of Mains	Miles Of Services
212	201	Clarksville Gas Department	9,101	5,248	0	0	0	0	356	237
207	202	Ieesburg, City of[c]	9,053	1,242	0	0	0	0	213	158
210	203	West Tenn. Public Util. Dist.	8,997	2,459	8,595	2,786	9,016	868	521	252
206	204	Orangeburg Public Utilities[c]	8,863	1,298	6,664	1,316	5,544	495	219	100
209	205	City of Sunrise	8,426	337	2,795	0	10,580	180	145	97
211	206	**Dalton Utilities, City of Dalton, Ga.**	**8,391**	**4,105**	**0**	**0**	**0**	**204**	**309**	**101**
213	207	**Southern Public Service Co.**	**8,162**	**914**	**5,298**	**399**	**2,380**	**237**	**150**	**50**
224	208	**Dyersburg Municipal Gas System**	**7,784**	**1,679**	**5,705**	**0**	**0**	**0**	**0**	**0**
214	209	**Northwest Alabama Gas District**	**7,768**	**6,268**	**17,179**	**1,619**	**14,067**	**116**	**630**	**356**
232	210	**Oak Ridge Utility District[g]**	**7,745**	**916**	**4,962**	**597**	**8,137**	**273**	**202**	**128**
219	211	Owatonna Public Utilities	7,669	1,845	7,320	89	9,541	1,835	128	89
215	212	Vicksburg Water & Gas Admin.	7,667	708	4,986	0	5,789	0	148	124
218	213	La Grange Gas Dept., City of	7,664	1,883	9,121	2,559	2,548	315	175	200
217	214	Lake Apopka Natural Gas Dist.	7,617	1,051	4,947	197	2,485	97	299	132
227	215	Decatur Utilities Gas Dept.	7,614	1,700	7,963	358	14,261	1,990	276	163
228	216	**Greenville Utilities Commission**	**7,506**	**1,408**	**7,545**	**1,096**	**6,387**	**998**	**214**	**140**
229	217	**Elk River Public Utility Dist.[g]**	**7,505**	**2,195**	**9,505**	**600**	**9,901**	**1,111**	**335**	**150**
220	218	**Norwich Dept. of Public Utilities**	**7,415**	**1,948**	**8,753**	**52**	**5,419**	**340**	**114**	**43**
221	219	**Westfield Gas & Electric Light Dept.**	**7,280**	**1,077**	**8,551**	**462**	**6,891**	**1,523**	**160**	**78**
223	220	**Graysville Municipal Gas System[i]**	**7,150**	**458**	**3,231**	**131**	**4,800**	**0**	**155**	**30**
222	221	Wilson, City of	7,006	943	5,440	1,414	3,367	386	145	43
226	222	Los Alamos County Utilities[c]	6,931	1,094	4,118	268	3,929	61	104	65
237	223	Powell-Clinch Utility District	6,863	868	4,745	220	8,366	2,117	239	198
234	224	Watertown Municipal Utilities	6,757	1,325	5,232	1,409	2,872	645	142	130
230	225	Cartersville Gas Dept., City of	6,698	2,182	8,685	1,750	0	1,200	208	186
235	226	**Del Rio Gas System, City of**	**6,545**	**331**	**0**	**0**	**0**	**0**	**188**	**113**
240	227	**Elizabethtown Natural Gas**	**6,331**	**1,037**	**4,421**	**191**	**7,606**	**626**	**160**	**102**
238	228	**Bristol & Warren Gas Co.**	**6,240**	**725**	**5,254**	**313**	**3,175**	**299**	**98**	**53**
243	229	**Covington Natural Gas System, City of**	**6,230**	**972**	**4,877**	**432**	**6,000**	**24**	**214**	**108**
239	230	**Pascagoula Utilities**	**6,207**	**800**	**5,000**	**502**	**4,000**	**900**	**240**	**76**
236	231	Fultondale Gas Board	6,160	445	3,214	1,809	0	0	162	100
241	232	St. Joseph Light & Power Co.	6,053	830	3,494	334	4,845	136	189	79
0	233	Eastern Shore Gas Co.	6,000	25	0	0	0	0	72	55
244	234	Pike Natural Gas Co.	5,995	945	5,240	0	2,345	0	175	20
233	235	Wyoming Gas Co.	5,993	1,183	6,456	0	0	0	183	18
245	236	**Union Gas Co.**	**5,844**	**885**	**3,869**	**0**	**0**	**0**	**175**	**150**
247	237	**Sylacauga Utilities Board[h]**	**5,827**	**1,647**	**6,145**	**1,217**	**4,104**	**466**	**451**	**111**
253	238	**Citizens Gas Utility District**	**5,724**	**549**	**3,442**	**0**	**0**	**0**	**440**	**251**
248	239	**Bay City Gas Co.**	**5,720**	**320**	**2,100**	**0**	**0**	**0**	**120**	**52**
251	240	**Shelby Gas Dept., City of**	**5,626**	**4,038**	**13,045**	**2,548**	**0**	**0**	**267**	**105**
252	241	Indiana Natural Gas Corp.	5,519	741	4,062	309	3,373	328	211	53
249	242	Utah Gas Service Co.	5,321	352	4,000	0	0	0	57	4
257	243	Lexington Natural Gas Dept., City of	5,243	2,598	8,647	1,838	0	0	238	91
256	244	City of Union	5,100	1,387	4,575	281	6,604	880	187	97
260	245	Suburban Natural Gas Inc.	5,066	936	4,393	5	3,120	0	250	23
255	246	**Wakefield Municipal Light Dept.**	**5,042**	**390**	**3,277**	**36**	**1,388**	**191**	**72**	**16**
259	247	**New Ulm Public Utilities Commission**	**4,980**	**2,440**	**6,128**	**0**	**0**	**0**	**72**	**95**
267	248	**Community Natural Gas Co.**	**4,913**	**564**	**3,034**	**177**	**3,279**	**680**	**224**	**120**
261	249	**Winfield, City of**	**4,840**	**724**	**3,156**	**0**	**8,425**	**0**	**85**	**23**
268	250	**Tuscola Natural Gas System**	**4,789**	**1,063**	**4,849**	**1,501**	**0**	**0**	**166**	**100**

The 300 Leading Gas Distribution Utilities

The P&GJ 500 . . . dimensions of the pipeline energy business

Rank 91	Rank 92	Name Of Company	Number Of Customers	1991 Gas Sales MMcf	1991 Financial: Operating Revenues $(000)	1991 Financial: Operating Income $(000)	Gas Plant Net Value $(000) 12-31-91	1991 Additions To Plant $(000)	Miles Of Mains	Miles Of Services
254	251	Moss Point Utilities, City of	4,765	362	0	0	0	0	98	48
278	252	Commission of Public Works, Laurens, SC	4,740	1,752	992	5,811	9,820	490	260	85
263	253	Westlake Municipal Natural Gas	4,718	251	1,614	0	0	0	91	30
264	254	Dumas, City of	4,679	6,751	1,906	0	0	0	0	0
266	255	Polaris Corp.	4,654	267	1,785	192	1,305	84	111	73
265	256	Canton Municipal Utilities	4,630	390	1,940	0	0	0	82	38
268	257	Chanute Gas Dept., City of	4,600	650	2,500	0	0	50	89	55
274	258	Syracuse Suburban Gas Co. Inc.	4,598	1,243	9,504	558	7,443	562	89	71
271	259	Palatka Gas Authority	4,556	224	1,453	921	1,582	57	91	77
270	260	Ft. Pierce Utilities Authority[1]	4,549	1,501	5,737	172	4,600	718	141	91
272	261	Chambersburg Gas Dept., Borough of	4,546	1,031	4,684	178	2,902	196	56	45
276	262	Lawrenceburg Gas Co.	4,512	1,187	5,641	366	8,520	760	123	98
273	263	Deming Gas System, City of	4,501	554	1,815	0	0	0	74	71
283	264	Summerville Natural Gas System	4,489	554	2,600	188	2,225	360	130	93
287	265	Greer Public Works	4,481	2,543	8,376	1,948	4,715	2,400	234	87
275	266	Thomasville Water & Light Dept.	4,447	466	2,995	422	1,275	0	141	157
277	267	Denham Springs, City of	4,336	282	1,912	0	0	0	118	33
279	268	Morton Utilities	4,274	1,099	4,037	0	0	0	84	74
284	269	Corinth Gas & Water Dept.[1]	4,254	972	3,456	429	4,288	525	106	60
281	270	Gery Forest Utilities	4,248	389	1,961	0	0	0	86	20
280	271	Nebraska City Utilities[1]	4,069	803	3,663	666	4,395	0	96	60
282	272	Thibodaux Gas System, City of	4,055	298	1,622	0	0	0	86	37
286	273	Las Vegas Natural Gas System	3,950	974	3,665	0	0	0	76	36
0	274	Picayune Utilities, City of	3,900	400	1,893	0	0	0	94	50
290	275	Southwestern Virginia Gas Co.	3,869	955	5,140	527	5,624	299	127	80
289	276	Bluefield Gas Co.	3,792	962	4,747	0	0	0	77	24
292	277	Zia Natural Gas Co.	3,790	389	2,295	0	0	0	115	64
0	278	Lebanon Gas Department	3,774	706	3,500	0	0	0	134	45
295	279	Alexander Municipal Gas Co.	3,756	930	3,871	784	10,117	0	116	71
297	280	St. Croix Valley Natural Gas Co.	3,708	660	2,700	0	0	0	70	33
291	281	Brownsville Utility Department	3,704	625	2,000	0	0	0	155	68
299	282	High Plains Natural Gas Co.	3,686	1,901	4,479	0	0	0	80	10
295	283	South Florida Gas Co.	3,672	528	1,650	0	0	0	105	79
294	284	City Gas Co.	3,665	563	3,500	141	1,503	63	103	71
296	285	Ft. Morgan Municipal Utilities	3,622	586	2,401	0	0	0	52	57
0	286	Pryor Municipal Utility Board[1]	3,610	298	1,177	401	1,672	87	71	16
288	287	Elberton Natural Gas System	3,609	382	0	0	0	0	127	0
0	288	Ft. Valley Utilities Commission	3,583	491	2,646	0	0	0	95	70
298	289	Dublin, City of	3,575	1,417	0	0	0	0	210	75
0	290	Fayetteville Gas System	3,544	1	3,105	577	4,174	136	122	96
0	291	Hawkins County Natural Gas District	3,506	747	3,715	0	0	0	153	60
0	292	City of Trinidad	3,502	719	2,659	0	0	0	27	30
300	293	Moultrie Gas Deparment	3,479	492	2,452	0	0	0	178	85
0	294	Humboldt Utilities	3,469	710	2,223	0	0	0	96	55
0	295	Guymon Municipal Gas Co.	3,459	604	2,300	0	0	0	85	7
0	296	Lake City Gas Co.	3,428	2,792	1,919	0	0	0	151	0
0	297	Robstown Utility Systems	3,315	235	458	0	0	0	55	1
0	298	St. James Parish Utilities	3,302	187	1,158	0	0	0	106	81
0	299	Cairo Public Utility Commission	3,221	1,009	3,711	0	0	0	50	62
0	300	Pearson City Gas Dept.	3,187	422	1,722	441	0	0	52	18

The 100 Leading Gas Pipelines

The P&GJ 500 . . . dimensions of the pipeline energy business

Rank 91	Rank 92	Name Of Company	Miles of Gas Pipeline Operated Total	Transmission	Gathering	Storage	1991 Gas Throughput MMcf	1991 Gas Transported MMcf	1991 Oper. Revenues $(000)	1991 Oper. Income $(000)	Gas Plant Net Value $(000) 12-31-91	Additions To Plant 1991 $(000)
1	1	Northern Natural Gas Co.	24,169	23,944	225	0	1,954,591	1,363,390	1,109,699	119,599	784,574	132,572
3	2	Columbia Gas Transmission Co.	18,787	11,097	6,478	1,212	1,316,227	744,815	1,021,028	-546,506	1,327,100	143,662
2	3	El Paso Natural Gas Co.	16,987	10,129	6,840	18	5,016,514	1,364,174	1,095,187	99,882	1,116,680	154,611
4	4	Tennessee Gas Pipeline Corp.	14,998	14,934	31	33	3,240,516	1,418,628	994,886	116,884	1,600,238	242,958
5	5	K N Energy Inc.	13,689	10,540	3,113	36	105,500	25,900	353,342	38,498	346,629	29,542
6	6	Natural Gas Pipeline Co. of America	12,805	10,907	1,683	295	1,618,916	1,314,356	1,541,762	192,447	1,022,513	207,360
8	7	ANR Pipeline Co.	12,492	6,633	5,729	130	970,067	730,345	597,881	65,005	535,453	535,453
7	8	Panhandle Eastern Pipe Line Co.	12,475	6,622	5,723	130	28,755	20,857	490,479	50,914	1,025,066	16,891
9	9	Transcontinental Gas Pipe Line Corp.	10,833	10,583	133	117	1,361,400	1,361,000	1,616,800	41,100	2,510,000	311,500
12	10	Texas Eastern Transmission Corp.	10,091	9,847	48	196	1,833,251	677,304	1,571,751	135,421	1,868,434	257,800
11	11	Arkla Energy Resources	9,980	6,486	3,427	67	543,600	488,200	1,218,900	60,100	1,465,700	133,200
13	12	Williams Natural Gas Co.	9,807	5,853	3,779	175	379,250	0	417,938	62,871	337,895	36,439
14	13	United Gas Pipe Line Co.	9,270	7,322	1,920	28	1,099,256	539,678	275,227	23,093	339,386	32,197
10	14	Lone Star Gas Co.	9,242	7,109	2,055	78	472,441	290,436	966,166	82,787	163,291	16,880
15	15	CNG Transmission Corp.	9,065	4,725	3,790	550	817,849	403,705	923,165	100,793	956,374	149,336
107	16	Delhi Pipeline Co.	8,357	1,331	7,026	0	291,401	95,472	0	0	0	0
16	17	Southern Natural Gas Co.	7,552	7,392	112	48	1,228,829	999,258	721,277	89,639	592,070	96,195
19	18	Texas Gas Transmission Corp.	6,153	5,886	39	228	1,012,588	607,641	464,938	45,487	588,031	52,371
18	19	Colorado Interstate Gas Co.	6,153	3,040	3,054	59	743,285	391,954	419,132	85,889	292,090	30,676
20	20	Enron Intrastate Pipelines	5,755	3,081	2,253	421	562,577	206,806	1,118,536	77,814	3,109,367	54,560
21	21	Pacific Gas & Electric Co.	5,377	4,288	1,037	52	836,700	95,500	0	0	0	0
22	22	Valero Transmission Co. LP	5,293	3,852	1,441	0	739,584	683,991	261,656	24,650	510,480	10,750
26	23	ONG Transmission Co.	5,176	5,176	0	0	194,309	50,974	6,887	17,422	191,010	45,651
23	24	Trunkline Gas Co.	4,775	4,218	530	27	805,315	430,845	467,225	30,880	337,401	14,822
87	25	Transwestern Pipeline Co.	4,510	4,510	0	0	317,365	274,401	248,895	31,509	485,815	7,780

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Circle 115

The 100 Leading Gas Pipelines

The P&GJ 500 . . . dimensions of the pipeline energy business

Rank 91	Rank 92	Name Of Company	Miles of Gas Pipeline Operated Total	Transmission	Gathering	Storage	1991 Gas Throughput MMcf	1991 Gas Transported MMcf	1991 Oper. Revenues $(000)	1991 Oper. Income $(000)	Gas Plant Net Value $(000) 12-31-91	Additions To Plant 1991 $(000)
24	26	Florida Gas Transmission Co.	4,426	4,426	0	0	592,184	272,804	524,046	24,204	278,162	127,592
25	27	Columbia Gulf Transmission Co.	4,278	2,543	1,735	0	2,485,355	1,110,742	144,574	18,262	915,555	28,015
27	28	Williston Basin Interstate Pipeline Co.	4,059	3,175	712	152	78,015	59,442	116,041	15,062	177,385	4,095
17	29	Northwest Pipeline Corp.	5,491	5,491	0	0	1,706,497	815,576	586,587	79,080	645,121	41,967
28	30	Southern California Gas Co.	5,595	5,267	0	128	1,026,842	480,479	5,212,625	276,110	505,005	559,645
30	31	National Fuel Gas Supply Corp.	3,256	1,418	1,375	463	247,992	117,210	482,744	29,521	198,400	4,786
29	32	Montana Power Co.	3,163	1,929	1,163	71	24,808	906	109,491	23,704	219,675	514
31	33	Enogex Inc.	3,010	908	2,102	0	150,653	150,653	63,008	24,454	67,072	6,350
32	34	East Ohio Gas Co., The	2,841	1,227	1,357	257	259,459	79,269	923,171	54,758	635,231	40,428
33	35	North Carolina Natural Gas Corp.	2,678	871	1,807	0	55,881	0	154,067	4,910	75,455	11,529
54	36	Southwestern Gas Pipeline Inc.	2,628	72	2,555	1	59,965	0	8,948	5,022	57,009	525
35	37	United Texas Transmission Co.	2,612	2,125	489	0	466,894	455,254	172,709	29,524	429,516	40,509
36	38	Michigan Consolidated Gas Co.	2,480	2,260	108	112	477,098	225,904	1,030,787	66,659	78,150	9,534
37	39	Questar Pipeline Co.	2,461	1,689	722	50	467,097	254,622	55,590	278,666	11,952	0
38	40	Peoples Natural Gas Co., The	2,238	950	1,250	38	75,729	28,270	314,551	52,118	575,297	25,615
106	41	Tejas Power Corp.	2,217	2,117	100	0	0	0	0	0	0	0
40	42	Kentucky-West Virginia Gas Co.	2,217	125	2,092	0	33,024	24,111	50,528	7,822	56,597	9,541
41	43	T. W. Phillips Gas & Oil Co.	2,187	1,148	1,039	0	19,858	1,165	68,809	7,191	70,446	5,260
43	44	Mississippi River Trans. Co.	2,162	2,018	65	79	263,000	177,200	317,651	15,584	204,649	10,462
44	45	Western Gas Supply Co.	2,150	1,678	453	19	95,307	58,460	140,288	10,781	43,109	24,602
45	46	Transok Inc.	2,146	1,006	1,140	0	26,600	0	115,521	10,241	155,165	8,505
42	47	Equitrans Inc.	2,106	529	1,459	158	81,100	41,779	179,508	17,166	141,216	4,116
46	48	Texas Utilities Fuel Co.	2,100	1,852	248	0	545,195	514	884,965	16,889	126,522	2,198
47	49	KPL Gas Service	2,051	1,692	357	2	48,975	50,095	690,359	27,171	48,824	81,961
54	50	Great Lakes Gas Transmission LP	1,960	1,960	0	0	619,495	0	185,588	55,297	989,559	540,724
48	51	Louisiana Intrastate Gas Corp.	1,858	1,858	0	0	215,117	209,274	74,514	11,358	151,993	2,714
49	52	Phillips Natural Gas Co.	1,811	352	1,459	0	170,318	0	53,238	21,930	193,323	8,477
50	53	Peoples Natural Gas	1,772	1,221	551	0	145,121	75,445	279,264	13,661	184,116	19,782
51	54	Arkansas Western Gas Co.	1,701	1,326	375	0	27,013	1,307	0	0	0	0
52	55	South Carolina Pipeline Corp.	1,692	1,692	0	0	93,000	15,705	227,602	15,097	91,888	4,880
81	56	Arkansas Oklahoma Gas Corp.	1,689	1,320	369	0	25,501	10,195	44,111	5,254	48,180	1,178
53	57	Exxon Gas System Inc.	1,651	1,651	0	0	297,276	216,491	160,558	17,022	74,000	8,552
55	58	Central Illinois Public Service Co.	1,577	21	1,556	0	20,268	11,391	111,699	17,808	90,247	4,701
56	59	Northern Indiana Public Service Co.	1,557	1,557	0	0	275,122	135,921	601,920	49,606	5,125,555	6,892
57	60	Consumers Power Co.	1,227	1,116	6	105	363,597	158,856	1,056,351	64,845	72,362	451
58	61	East Tennessee Natural Gas Co.	1,149	1,149	0	0	89,359	7,194	222,045	12,059	139,282	23,239
60	62	Carnegie Natural Gas Co.	1,087	221	866	0	26,436	19,198	70,364	3,921	54,285	192
62	63	Algonquin Gas Transmission Co.	1,003	1,003	0	0	236,095	173,571	397,773	27,791	301,084	76,745
61	64	Ferguson Crossing Pipe Line Co.	994	58	936	0	27,014	5,354	12,838	8,476	22,274	1,713
63	65	Bridgeline Gas Distribution Co.	950	850	0	0	150,000	0	2,000	0	0	0
68	66	South Georgia Natural Gas Co.	847	847	0	0	51,404	28,471	24,084	2,009	15,785	4,204
64	67	Pacific Gas Transmission Co.	841	799	42	0	486,000	157,000	799,154	19,510	205,075	25,078
66	68	Northern Border Pipeline Co.	822	822	0	0	441,977	441,977	155,899	71,458	977,905	25,305
65	69	North Penn Gas Co.	822	570	241	11	8,476	5,254	57,211	4,260	48,814	5,855
67	70	Paiute Pipeline Co.	770	770	0	0	58,855	51,555	57,637	4,977	25,886	1,760
69	71	Hadson Gas Systems Inc.	759	425	330	4	300,000	0	600	0	0	0
70	72	Michigan Gas Storage Co.	693	545	0	148	230,925	229,396	(1,342)	4,118	1,511	360
72	73	Intermountain Gas Co.	641	641	0	0	196,882	0	25,311	0	21,035	3,027
73	74	Llano Inc.	623	398	225	0	30,405	30,405	50,462	2,301	0	0
74	75	Apollo Gas Co.	610	69	541	0	2,262	0	11,657	1,071	24,854	1,920

The 100 Leading Gas Pipelines

The P&GJ 500 . . . dimensions of the pipeline energy business

Rank 91	Rank 92	Name Of Company	Miles of Gas Pipeline Operated Total	Transmission	Gathering	Storage	1991 Gas Throughput MMcf	1991 Gas Transported MMcf	1991 Oper. Revenues $(000)	1991 Oper. Income $(000)	Gas Plant Net Value $(000) 12-31-91	Additions To Plant 1991 $(000)
75	76	Monterey Pipeline Co.	598	598	0	0	49,971	9,888	85,994	6,759	22,142	1,551
76	77	Washington Gas Light Co.	575	557	18	0	128,529	1,415	705,295	72,908	89,577	78,580
78	78	Palo Duro Pipeline Co.	559	388	171	0	20,882	20,852	4,475	0	56,962	1,561
79	79	Sunterra Gas Gathering Corp.	558	2	556	0	41,538	18,887	67,658	1,920	17,205	510
80	80	Viking Gas Transmission Co.[1]	549	549	0	0	159,818	129,034	70,816	4,402	14,757	1,598
82	**81**	**Inland Gas Co. Inc.**	**511**	**118**	**393**	**0**	**5,653**	**2,096**	**15,585**	**4,024**	**6,415**	**987**
83	**82**	**National Gas & Oil Corp.**	**509**	**0**	**501**	**8**	**12,177**	**6,211**	**30,624**	**2,540**	**0**	**0**
85	**83**	**Southeast Alabama Gas District**	**505**	**505**	**0**	**0**	**8,817**	**0**	**0**	**0**	**0**	**0**
86	**84**	**Winnie Pipeline Co.**	**496**	**426**	**70**	**0**	**11,827**	**0**	**5,460**	**3,796**	**21,553**	**1,618**
39	**85**	**Southern Union Co.**	**478**	**428**	**50**	**0**	**44,942**	**8,608**	**200,261**	**987**	**8,511**	**3,323**
89	86	XCL Sunrise Inc.	464	89	370	5	5,500	10	0	0	0	750
88	87	Seagull Gas Pipeline Corp.	457	201	256	0	220,685	0	178,401	55,685	241,259	1,851
93	88	Sea Robin Pipeline Co.	457	447	10	0	254,154	254,145	27,905	5,517	15,765	2,599
90	89	Amoco Gas Co.	457	457	0	0	169,255	58,759	200,598	14,505	27,647	1,910
91	90	Trailblazer Pipeline Co.	456	456	0	0	120,420	120,475	55,851	16,418	174,957	51
92	**91**	**Acadian Gas Pipeline System**	**430**	**430**	**0**	**0**	**212,762**	**63,100**	**291,000**	**6,952**	**138,000**	**2,000**
96	**92**	**Pacific Interstate Co.**	**367**	**367**	**0**	**0**	**105,965**	**0**	**365,985**	**10,758**	**132,774**	**10,000**
94	**93**	**Alaska Pipeline Co.**	**360**	**350**	**0**	**10**	**39,608**	**39,608**	**101,948**	**11,722**	**74,182**	**2,347**
95	**94**	**Midwestern Gas Transmission Co.**	**354**	**354**	**0**	**0**	**133,066**	**99,169**	**126,328**	**2,451**	**34,690**	**1,623**
0	**95**	**Greeley Gas Co.**	**335**	**335**	**0**	**0**	**21,503**	**2,356**	**63,620**	**4,025**	**49,676**	**379**
97	96	Alabama-Tennessee Natural Gas Co.	515	515	0	0	55,500	0	22,900	0	0	0
99	97	Valero Interstate Trans. Co.	280	161	119	0	66,592	57,721	17,474	1,091	4,451	200
98	98	Louisville Gas & Electric	275	177	0	98	40,621	6,251	166,291	10,455	157,755	15,785
100	99	Wyoming Interstate Co.	269	269	0	0	128,458	0	11,962	12,957	115,864	(5)
105	100	MIGC Inc.	252	204	28	0	228,004	0	4,825	0	0	0

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Circle 117

The 100 Leading Liquids Pipelines

The P&GJ 500 . . . dimensions of the pipeline energy business

Rank 91	Rank 92	Name of Company	Barrels Delivered Out Of System In 1991 (000) Total	Crude Oil	Products	1991 Financial Operating Rev ($000)	Oper. Income ($000)	Plant Net Value ($000) 12-31-91	Additions to Prop. Value ($000)	Miles of Pipeline Owned/Operated Gath. Lines	Crude Trunk	Products Trunk	Total
5	1	Alyeska Pipeline Service Co.	665,175	665,175	0	0	0	0	0	0	800	0	800
1	2	Colonial Pipeline Co.	659,814	0	659,814	518,567	278,815	785,509	20,881	0	0	5,724	5,724
2	3	Marathon Pipe Line Co.	607,769	361,010	246,759	152,286	72,614	167,562	5,006	1,207	1,561	2,075	4,843
5	4	Shell Pipe Line Corp.	575,562	455,991	157,571	197,216	74,205	201,711	26,889	2,081	4,616	510	7,207
4	5	Chevron Pipe Line Co.	571,920	550,891	241,029	225,221	67,274	988,925	25,952	2,014	2,492	5,291	7,797
6	**6**	**Texaco Pipeline Inc.**	**568,364**	**429,797**	**138,567**	**134,791**	**52,571**	**221,542**	**26,064**	**1,910**	**3,195**	**1,252**	**6,355**
7	**7**	**Exxon Pipeline Co.**	**536,914**	**427,640**	**109,274**	**781,110**	**279,923**	**1,254,791**	**57,679**	**1,802**	**4,917**	**2,593**	**9,312**
9	**8**	**Amoco Pipeline Co.**	**483,459**	**330,343**	**153,116**	**199,947**	**74,801**	**258,473**	**16,032**	**2,248**	**7,322**	**2,298**	**11,868**
10	**9**	**Lakehead Pipe Line Co. LP**	**442,260**	**442,260**	**0**	**202,531**	**66,362**	**609,575**	**29,708**	**0**	**2,614**	**0**	**2,614**
11	**10**	**BP Pipelines (Alaska) Inc.**	**342,536**	**342,536**	**0**	**1,168,029**	**317,185**	**2,868,996**	**101,292**	**0**	**819**	**0**	**819**
12	11	LOOP Inc.	330,611	330,611	0	0	0	655,884	0	0	48	0	48
13	12	Santa Fe Pacific Pipelines Inc.	321,086	0	321,086	195,458	95,829	454,018	9,046	0	0	5,298	5,298
14	13	Mobil Pipe Line Co.	308,216	208,235	99,981	145,605	57,126	105,779	11,672	5,145	4,642	1,554	9,339
8	14	ARCO Pipe Line Co.	285,965	205,551	80,414	64,107	(6,059)	207,206	296,501	908	2,255	2,596	5,757
16	15	BP Oil Pipeline Co.	281,820	185,627	96,195	71,220	25,818	70,715	5,127	0	455	198	651
15	**16**	**Buckeye Pipe Line Co. LP**	**269,141**	**0**	**269,141**	**131,892**	**48,665**	**452,096**	**9,106**	**0**	**0**	**3,031**	**3,031**
17	**17**	**Conoco Pipe Line Co.**	**256,908**	**194,232**	**62,676**	**86,867**	**24,768**	**155,685**	**20,886**	**4,519**	**1,409**	**2,140**	**8,068**
18	**18**	**Phillips Pipe Line Co.**	**242,225**	**56,544**	**185,681**	**153,521**	**48,150**	**400,942**	**128,917**	**986**	**806**	**4,293**	**6,085**
19	**19**	**LOCAP Inc.**	**227,347**	**227,347**	**0**	**20,367**	**12,502**	**76,221**	**752**	**0**	**59**	**0**	**59**
0	**20**	**ARCO Transportation Alaska Inc.**	**193,371**	**178,367**	**15,004**	**488,811**	**249,789**	**1,221,087**	**44,428**	**1,626**	**2,598**	**2,864**	**6,888**
20	21	Plantation Pipe Line Co.	179,977	0	179,977	112,157	41,057	122,745	4,017	0	0	562	562
23	22	Mid-America Pipeline Co.	162,647	29,045	133,602	155,215	74,895	295,407	10,775	0	19	7,112	7,131
21	23	Williams Pipe Line Co.	158,577	2,916	155,461	159,917	26,158	472,524	29,251	0	0	6,646	6,646
22	24	Sun Pipe Line Co.	150,024	41,816	108,208	68,170	11,584	80,556	7,745	570	580	1,757	2,487
0	25	TE Products Pipeline Co. LP	147,247	0	147,247	138,796	50,195	495,150	17,506	0	0	4,109	4,109
26	**26**	**Mid-Valley Pipeline Co.**	**144,394**	**144,394**	**0**	**45,847**	**17,959**	**35,303**	**3,422**	**0**	**1,089**	**0**	**1,089**
24	**27**	**Explorer Pipeline Co.**	**122,759**	**0**	**122,759**	**73,416**	**37,255**	**262,374**	**2,694**	**0**	**0**	**1,397**	**1,397**
29	**28**	**Kuparuk Transportation Co.**	**120,392**	**120,392**	**0**	**(170,607)**	**(185,270)**	**90,853**	**0**	**0**	**37**	**0**	**37**
28	**29**	**CITGO Pipeline Co.**	**120,345**	**112,163**	**8,182**	**18,697**	**4,086**	**17,584**	**2,484**	**585**	**692**	**0**	**1,277**
27	**30**	**West Texas Gulf Pipe Line Co.**	**119,734**	**119,734**	**0**	**29,724**	**13,489**	**7,290**	**1,820**	**0**	**579**	**0**	**579**
35	31	Four Corners Pipe Line Co.	116,190	116,190	0	52,795	15,578	98,147	6,215	272	1,183	0	1,455
31	32	Texas-New Mexico Pipe Line Co.	110,510	110,510	0	29,804	9,171	12,815	6,064	1,654	2,195	0	3,849
30	33	Koch Pipelines Inc.	106,679	49,662	57,017	69,860	24,464	215,667	18,677	914	1,105	1,826	3,845
33	34	Ashland Pipe Line Co.	106,551	105,910	421	62,695	15,667	95,642	30,174	684	1,154	8	1,846
32	35	Chicap Pipeline Co.	99,147	99,147	0	15,709	7,758	19,124	949	0	205	0	205
36	**36**	**Wolverine Pipe Line Co.**	**97,554**	**0**	**97,554**	**28,345**	**16,057**	**27,768**	**462**	**0**	**0**	**621**	**621**
34	**37**	**Olympic Pipe Line Co.**	**96,092**	**0**	**96,092**	**28,806**	**12,301**	**52,537**	**1,648**	**0**	**0**	**416**	**416**
38	**38**	**Total Pipeline Corp.**	**92,318**	**76,039**	**16,279**	**13,053**	**(599)**	**47,226**	**5,454**	**585**	**590**	**138**	**1,313**
37	**39**	**Atlantic Pipeline Corp.**	**91,430**	**47,373**	**44,057**	**53,581**	**7,577**	**67,289**	**2,641**	**0**	**12**	**929**	**941**
46	**40**	**Ottarokling Pipeline Inc.**	**87,547**	**77,699**	**9,848**	**6,843**	**3,041**	**8,270**	**1,194**	**0**	**19**	**13**	**32**
40	41	Minnesota Pipe Line Co.	78,422	78,422	0	26,665	8,556	81,791	1,589	0	675	0	675
41	42	Shamrock Pipeline Corp.	72,900	46,957	25,943	20,507	4,804	56,597	525	549	418	603	1,570
44	43	Badger Pipeline Co.	69,772	0	69,772	12,558	4,969	8,451	555	0	0	287	287
39	44	Lake Charles Pipe Line Co.	68,818	0	68,818	5,329	1,644	5,122	107	0	0	15	15
42	45	Southcap Pipe Line Co.	68,525	68,525	0	22,686	7,517	26,989	798	0	0	0	0
45	**46**	**West Shore Pipe Line Co.**	**65,839**	**0**	**65,839**	**17,568**	**8,001**	**13,423**	**651**	**0**	**0**	**321**	**321**
47	**47**	**Unocal Pipeline Co.**	**63,322**	**62,807**	**515**	**49,166**	**5,686**	**96,577**	**3,429**	**236**	**1,446**	**16**	**1,698**
54	**48**	**Portland Pipe Line Corp.**	**58,216**	**58,216**	**0**	**28,701**	**12,455**	**12,326**	**365**	**0**	**167**	**0**	**167**
48	**49**	**Seminole Pipeline Co.**	**57,536**	**0**	**57,536**	**36,459**	**12,544**	**165,536**	**6,812**	**106**	**0**	**634**	**740**
49	**50**	**Kaneb Pipe Operating Part. LP**	**51,389**	**0**	**51,389**	**39,287**	**15,859**	**62,464**	**2,505**	**0**	**0**	**2,101**	**2,101**

The 100 Leading Liquids Pipelines

The P&GJ 500 . . . dimensions of the pipeline energy business

Rank 91	Rank 92	Name of Company	Barrels Delivered Out Of System In 1991 (000) Total	Crude Oil	Products	1991 Financial Operating Rev ($000)	Oper. Income ($000)	Plant Net Value ($000) 12-31-91	Additions To Prop. Value ($000)	Miles of Pipeline Owned/Operated Gath. Lines	Crude Trunk	Products Trunk	Total
50	51	Jayhawk Pipeline Corp.	49,655	49,655	0	15,571	5,519	50,848	0	787	729	0	1,516
60	52	Chaparral Pipeline (NGL) Co.	49,510	0	49,510	27,852	15,582	85,205	481	0	0	829	829
52	53	Collins Pipeline Co.	48,724	0	48,724	6,578	2,209	9,636	1,170	0	0	124	124
51	54	Kenai Pipe Line Co.	45,951	27,564	16,387	7,435	5,752	5,778	8	0	25	0	25
57	55	All American Pipeline Co.	45,604	45,604	0	46,649	(35,710)	1,494,681	0	0	1,219	0	1,219
55	**56**	**Endicott Pipeline Co.**	**42,528**	**42,528**	**0**	**50,195**	**16,173**	**31,496**	**347**	**0**	**26**	**0**	**26**
56	**57**	**Osage Pipe Line Co.**	**40,550**	**40,550**	**0**	**7,219**	**5,005**	**10,944**	**311**	**0**	**136**	**0**	**136**
53	**58**	**Plate Pipe Line Co.**	**39,655**	**39,655**	**0**	**22,775**	**14,225**	**5,824**	**279**	**0**	**1,282**	**0**	**1,282**
58	**59**	**American Petrofina Pipe Line Co.**	**34,878**	**34,878**	**0**	**12,957**	**4,629**	**26,857**	**4,822**	**0**	**1,104**	**0**	**1,104**
59	**60**	**Mid-Continent Pipe Line Co.**	**34,289**	**34,289**	**0**	**19,653**	**7,704**	**21,849**	**1,367**	**1,685**	**903**	**0**	**2,588**
64	61	Enron Liquids Pipeline Co.	54,260	0	54,260	10,597	10,894	77,281	980	0	0	1,614	1,614
62	62	Dixie Pipeline Co.	52,600	0	52,600	42,400	14,600	21,500	5,000	0	0	1,305	1,305
63	63	Butte Pipe Line Co.	52,275	52,275	0	8,554	2,492	2,682	452	0	575	0	575
61	64	Laurel Pipe Line Co.	50,554	0	50,554	15,008	4,427	7,541	215	0	0	546	546
67	65	Golden Valley Electric Association Inc.	50,279	50,279	0	1,557	704	2,772	0	0	7	0	7
69	**66**	**Belle Fourche Pipeline Co.**	**29,631**	**29,631**	**0**	**2,490**	**499**	**11,168**	**642**	**1,313**	**729**	**0**	**2,042**
66	**67**	**Calnev Pipe Line Co.**	**28,962**	**0**	**28,962**	**21,253**	**7,510**	**93,211**	**2,098**	**0**	**0**	**583**	**583**
70	**68**	**Mobil Alaska Pipeline Co.**	**27,549**	**27,549**	**0**	**102,756**	**57,811**	**231,462**	**5,788**	**0**	**0**	**0**	**0**
73	**69**	**Mobil Eugene Island Pipeline Co.**	**27,145**	**27,145**	**0**	**23,773**	**19,110**	**16,126**	**(161)**	**0**	**134**	**0**	**134**
68	**70**	**Paloma Pipe Line Co.**	**26,686**	**26,686**	**0**	**2,579**	**745**	**2,300**	**575**	**0**	**0**	**0**	**0**
65	71	Hess Pipeline Co.	26,589	26,589	0	12,190	4,609	15,221	1,340	0	447	0	447
71	72	Cochin Pipeline System	26,060	0	26,060	48,566	25,477	135,814	154	0	0	1,197	1,197
72	73	Yellowstone Pipeline Co.	24,715	0	24,715	16,125	7,744	8,256	625	0	0	751	751
89	74	Sun Oil Line Co. of Michigan	20,828	20,828	0	5,705	679	127	0	0	4	0	4
74	75	Clark Pipe Line Co.	20,546	20,546	0	2,981	1,966	1,401	465	0	55	0	55
79	**76**	**Farmland Industries Inc.**	**20,317**	**20,317**	**0**	**5,333**	**1,514**	**13,789**	**512**	**614**	**239**	**0**	**853**
77	**77**	**Kiantone Pipeline Co.**	**20,303**	**20,303**	**0**	**4,264**	**867**	**6,398**	**17**	**0**	**78**	**0**	**78**
0	**78**	**Sun Pipe Line Services Co.**	**20,251**	**20,251**	**0**	**8,856**	**4,534**	**11,439**	**112**	**224**	**174**	**0**	**398**
78	**79**	**Wyco Pipe Line Co.**	**20,217**	**0**	**20,217**	**15,261**	**8,849**	**30,298**	**1,260**	**0**	**0**	**677**	**677**
75	**80**	**Buckeye Pipe Line Co. of Michigan LP**	**18,835**	**11,391**	**7,444**	**6,215**	**1,413**	**37,011**	**26**	**0**	**164**	**0**	**164**
104	81	Pioneer Pipe Line Co.	18,850	0	18,850	6,252	1,465	2,698	95	0	0	299	299
76	82	Portal Pipe Line Co.	17,455	17,455	0	11,920	5,278	24,117	239	337	615	0	952
82	83	Coastal Pipeline Co.	17,189	0	17,189	5,992	2,159	5,245	151	0	0	8	8
84	84	Ohio River Pipe Line Co.	15,278	0	15,278	8,811	2,497	20,751	1,547	0	0	400	400
85	85	Kaw Pipe Line Co.	14,082	14,082	0	5,632	1,501	2,274	438	1,361	0	0	1,361
86	**86**	**Gulf Central Pipeline Co.**	**12,747**	**0**	**12,747**	**24,665**	**16,187**	**67,238**	**1,257**	**0**	**0**	**1,975**	**1,975**
87	**87**	**Chase Transportation Co.**	**12,143**	**0**	**12,143**	**6,901**	**2,833**	**27,360**	**228**	**0**	**0**	**716**	**716**
90	**88**	**Antelope Pipe Line Co.**	**11,821**	**11,821**	**0**	**3,254**	**1,120**	**2**	**0**	**0**	**86**	**0**	**86**
91	**89**	**Dome Pipeline Corp.**	**11,610**	**0**	**11,610**	**2,350**	**384**	**11,159**	**423**	**0**	**0**	**134**	**134**
83	**90**	**Diamond Shamrock R&M**	**11,352**	**0**	**11,352**	**19,372**	**3,682**	**27,247**	**63**	**0**	**0**	**622**	**622**
99	91	Cook Inlet Pipe Line Co.	10,657	10,657	0	20,040	6,241	27,522	478	0	55	0	55
92	92	Amerada Hess Pipeline Corp.	10,022	10,022	0	36,903	21,194	87,938	5,036	0	819	0	819
88	93	Tesoro Alaska Pipe Line Co.	9,451	0	9,451	5,753	3,067	12,069	0	0	0	70	70
93	94	Phillips Alaska Pipeline Co.	9,161	9,161	0	55,844	16,957	74,357	2,757	0	0	0	0
106	95	Joliet Pipe Line Co.	8,867	8,867	0	6,030	5,026	10,495	75	29	0	0	29
80	**96**	**Tecumseh Pipe Line Co.**	**8,668**	**8,668**	**0**	**1,080**	**(1,547)**	**1,004**	**6**	**0**	**207**	**0**	**207**
95	**97**	**Giant Industries Arizona**	**8,514**	**7,003**	**1,511**	**2,897**	**281**	**4,851**	**2,264**	**176**	**135**	**11**	**322**
94	**98**	**Mapco Ammonia Pipeline Inc.**	**8,427**	**0**	**8,427**	**10,411**	**5,095**	**19,116**	**77**	**0**	**0**	**1,097**	**1,097**
98	**99**	**Crown-Rancho Pipe Line Corp.**	**7,527**	**7,527**	**0**	**2,292**	**1,669**	**220**	**9**	**0**	**0**	**0**	**0**
100	**100**	**Milne Point Pipe Line Co.**	**7,458**	**7,458**	**0**	**8,953**	**5,353**	**21,904**	**245**	**11**	**0**	**0**	**11**

Top 300 Gas Utilities Alphabetical Listing

Company	1992 Rank
Alabama Gas Corp.	85
Albany Water, Gas & Light Commission	162
Alexander Municipal Gas Co.	270
Alexandria Gas Dept., City of	168
Arkansas Oklahoma Gas Corp.	183
Arkansas Western Gas Co.	70
Arkla Inc.	8
Atlanta Gas Light Co.	9
Atmos Energy Corp.	25
Austell Natural Gas System	154
Austin Culinary	196
Baltimore Gas & Electric Co.	27
Battle Creek Gas Co.	157
Bay City Gas Co.	249
Bay State Gas Co.	51
Berkshire Gas Co.	141
Bluefield Gas Co.	276
Boston Gas Co.	29
Bristol & Warren Gas Co.	228
Brooklyn Union Gas Co.	12
Brownsville Utility Department	281
CP National Corp.	112
Cairo Public Utility Commission	293
Cardinal Municipal Utilities	256
Carnesville Gas Dept., City of	225
Cascade Natural Gas Corp.	90
Cedar Falls Utilities	195
Central Hudson Gas & Electric Corp.	119
Central Illinois Light Co.	68
Central Illinois Public Serv. Co.	75
Chambersburg Gas Dept., Borough of	261
Chanute Gas Dept., City of	257
Charlottesville Public Works, City of	176
Chattanooga Gas Co.	129
Chesapeake Utilities Corp.	146
Cheyenne Light Fuel & Power Co.	149
Cincinnati Gas & Electric Co.	36
Citizens Gas & Coke Utility	57
Citizens Gas Fuel Co.	186
Citizens Gas Utility District	238
Citizens Utilities Arizona Division	117
Citizens Utilities Colorado Division	190
Citizens Utilities Louisiana	58
City Gas Co.	284
City Gas of Florida	101
City Public Service of San Antonio	47
City of Sunrise	205
City of Trinidad	292
City of Union	244
Clarksville Gas Department	201
Clearwater Gas System	189
Clinton-Newberry Gas Authority	195
Colonial Gas Co.	89
Colorado Springs Utilities	90
Columbia Gas Of Kentucky Inc.	87
Columbia Gas of Maryland Inc.	144
Columbia Gas of Ohio Inc.	10
Columbia Gas of Pennsylvania	42
Commission of Public Works, Laurens, SC	252
Commonwealth Gas Co.	62
Commonwealth Gas Services Inc.	84
Community Natural Gas Co.	248
Connecticut Natural Gas Corp.	83
Consolidated Edison Co. of New York Inc.	14
Consolidated Gas Distribution Companies	4
Consumers Power Co.	7
Corinth Gas & Water Dept.	269
Corning Natural Gas Corp.	180
Corpus Christi Gas Division, City of	120
Covington Natural Gas System, City of	229
Dalton Utilities, City of Dalton, Ga.	206
Danville Water Gas & Electric Dept.	170
Dayton Power & Light Co.	48
Decatur Utilities Gas Dept.	215
Del Rio Gas System, City of	226
Delmarva Power & Light Co.	104
Delta Natural Gas Co. Inc.	139
Deming Gas System, City of	263
Denham Springs, City of	267
Dublin, City of	289
Duluth Dept. of Water & Gas, City of	157
Dumas, City of	254
Dyersburg Municipal Gas System	208
Eastern Shore Gas Co.	233
Elberton Natural Gas System	287
Elizabethtown Gas Co.	61
Elizabethtown Natural Gas	227

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Top 300 Gas Utilities Alphabetical Listing

Company	1992 Rank
Elk River Public Utility Dist.	217
Energy Services of Pensacola	128
EnergyNorth Inc.	118
Enstar Natural Gas Co.	107
Equitable Gas Co.	49
Essex County Gas Co.	155
Fall River Gas Co.	126
Fayetteville Gas System	290
Fitchburg Gas & Electric Light Co.	171
Florence Gas Dept., City of	179
Florida Public Utilities Co.	156
Ft. Hill Natural Gas Authority	166
Ft. Morgan Municipal Utilities	285
Ft. Pierce Utilities Authority	260
Ft. Valley Utilities Commission	288
Fultondale Gas Board	231
Gainesville Gas Co.	165
Gas Co. of New Mexico	44
Gasco Inc.	114
Graysville Municipal Gas System	220
Great Falls Gas Co.	164
Great Plains Natural Gas Co.	167
Greeley Gas Co.	99
Greenville Utilities Commission	216
Greenwood Commission of Public Works	182
Greer Public Works	265
Grey Forest Utilities	270
Gulf States Utilities Co.	106
Guymon Municipal Gas Co.	295
Hamilton Municipal Utilities	155
Hastings Utilities	194
Hawkins County Natural Gas District	291
Henderson Municipal Gas System	200
High Plains Natural Gas Co.	282
Hobbs Gas Co.	191
Holyoke Gas & Electric Dept., City of	192
Houma Municipal Gas System	175
Humboldt Utilities	294
Huntsville Utilities Gas System	142
IES Industries	74
Illinois Gas Co.	197
Illinois Power Co.	37
Indiana Gas Co. Inc.	34
Indiana Natural Gas Corp.	241
Intermountain Gas Industries Inc.	94
Interstate Power Co.	123
Iowa Southern Utilities Co.	132
Iowa-Illinois Gas & Electric Co.	60
Jackson Utility Division	160
K N Energy Inc.	65
KPL Gas Service	13
Knoxville Utilities Board	131
Kokomo Gas & Fuel Co.	145
La Grange Gas Dept., City of	213
Laclede Gas Co.	22
Lake Apopka Natural Gas Dist.	214
Lake City Gas Co.	296
Lancaster Municipal Gas Co.	177
Las Cruces Gas System, City of	161
Las Vegas Natural Gas System	273
Lawrenceburg Gas Co.	262
Lawrenceville Natural Gas System	178
Lebanon Gas Department	278
Leesburg, City of	202
Lexington Natural Gas Dept., City of	243
Lone Star Gas Co.	8
Long Beach Gas Dept.	81
Long Island Lighting Co.	33
Los Alamos County Utilities	222
Louisville Gas & Electric Co.	55
Madison Gas & Electric Co.	102
Marshall County Gas District	175
Memphis Light, Gas & Water Div.	52
Mesa, City of	154
Metropolitan Utilities District of Omaha	78
Michigan Consolidated Gas Co.	11
Michigan Gas Co.	105
Michigan Gas Utilities Co.	86
Middle Tennessee Natural Gas Util.-Dist.	151
Midwest Energy Inc.	183
Midwest Gas	41
Midwest Natural Gas Corp.	187
Mississippi Valley Gas Co.	59
Mobile Gas Service Corp.	103
Montana Power Co.	92
Montana-Dakota Utilities Co.	70
Morton Utilities	268

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Top 300 Gas Utilities Alphabetical Listing

Company	1992 Rank
Moss Point Utilities, City of	251
Moultrie Gas Department	293
Mountain Fuel Supply Co.	28
Mountaineer Gas Co.	67
NE Okla. Public Facilities Authority	181
National Fuel Gas Distribution Corp.	18
National Gas & Oil Corp.	156
Natural Gas Co. of Louisiana	172
Nebraska City Utilities	271
New Jersey Natural Gas Co.	46
New Orleans Public Service Inc.	77
New Ulm Public Utilities Commission	247
New York State Electric & Gas Corp.	82
Niagara Mohawk Power Corp.	30
North Carolina Natural Gas Corp.	93
North Penn Gas Co.	138
North Shore Gas Co.	91
Northern Illinois Gas Co.	5
Northern Indiana Fuel & Light Co. Inc.	148
Northern Indiana Public Service Co.	23
Northern States Power Co.	40
Northwest Alabama Gas District	209
Northwest Natural Gas Co.	45
Northwestern Public Service Co.	113
Norwich Dept. of Public Utilities	218
Oak Ridge Utility District	210
Ohio Gas Co.	135
Ohio Valley Gas Corp.	147
Okaloosa County Gas District	152
Oklahoma Natural Gas Co.	20
Orange & Rockland Utilities Inc.	97
Orangeburg Public Utilities	204
Owatonna Public Utilities	211
Pacific Gas & Electric Co.	2
Palatka Gas Authority	259
Palo Alto Utilities, City of	153
Pascagoula Utilities	230
Penn Fuel Gas Inc.	143
Pennsylvania & Southern Gas Co.	165
Pennsylvania Gas & Water Co.	85
Peoples Gas Light & Coke Co.	17
Peoples Gas System Inc.	71
Perryton City Gas Dept.	300
Philadelphia Electric Co.	43
Philadelphia Gas Works	26
Picayune Utilities, City of	274
Piedmont Natural Gas Co.	32
Pike Natural Gas Co.	234
Polaris Corp.	255
Powell-Clinch Utility District	223
Providence Gas Co.	76
Pryor Municipal Utility Board	286
Public Service Co. of Colorado	15
Public Service Co. of N.C. Inc.	56
Public Service Electric & Gas Co.	6
Richmond Gas Corp.	174
Richmond Public Utilities	110
Rio Grande Valley Gas Co.	111
Roanoke Gas Co.	124
Robstown Utility Systems	297
Rochester Gas & Electric Corp.	54
Rocky Mount, City of	188
San Diego Gas & Electric Co.	21
Shelby Gas Dept., City of	240
South Carolina Electric & Gas Co.	66
South Florida Gas Co.	283
South Jersey Gas Co.	64
Southeast Alabama Gas District	140
Southeastern Michigan Gas Co.	108
Southern California Gas Co.	1
Southern Connecticut Gas Co.	80
Southern Indiana Gas & Elect. Co.	98
Southern Public Service Co.	207
Southern Union Gas Co.	38
Southwest Gas Corp.	16
Southwestern Virginia Gas Co.	275
Springfield City Utilities	116
St. Croix Valley Natural Gas Co.	280
St. James Parish Utilities	298
St. Joseph Light & Power Co.	232
St. Lawrence Gas Co.	185
Suburban Natural Gas Inc.	245
Summerville Natural Gas System	264
Superior Water, Light & Power Co.	198
Sylacauga Utilities Board	237
Syracuse Suburban Gas Co. Inc.	258
T. W. Phillips Gas & Oil Co.	121

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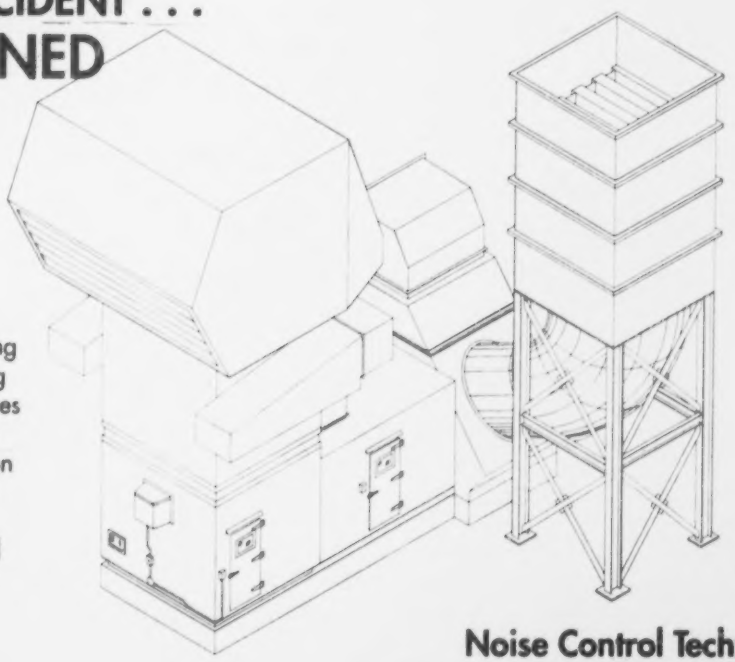

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Top 300 Gas Utilities Alphabetical Listing

Company	1992 Rank	Company	1992 Rank	Company	1992 Rank
Tallahassee Municipal Gas System	199	Vermont Gas Systems, Inc.	158	Westpac Utilities	109
Thibodaux Gas System, City of	272	Vicksburg Water & Gas Admin.	212	Willmut Gas & Oil Co.	159
Thomasville Water & Light Dept.	266	Virginia Natural Gas	73	Wilson, City of	221
Toccoa Natural Gas System	250	Wakefield Municipal Light Dept.	246	Winfield, City of	249
Trussville Utilities Board	169	Warner Robins, City of	184	Wisconsin Fuel & Light Co.	127
UGI Corp.	63	Washington Gas Light Co.	19	Wisconsin Gas Co.	31
Union Electric Co.	95	Washington Natural Gas Co.	39	Wisconsin Natural Gas Co.	50
Union Gas Co.	236	Washington Water Power Co.	100	Wisconsin Power & Light Corp.	88
Union Light, Heat & Power Co.	115	Watertown Municipal Utilities	224	Wisconsin Public Service Corp.	69
United Cities Gas Co.	53	West Florida Natural Gas Co.	150	Wisconsin Southern Gas Co. Inc.	125
Utah Gas Service Co.	242	West Tenn. Public Util. Dist.	203	Wyoming Gas Co.	235
UtiliCorp United Inc.	24	Westfield Gas & Electric Light Dept.	219	Yankee Gas Services Co.	72
Valley Resources Inc.	122	Westlake Municipal Natural Gas	253	Zia Natural Gas Co.	277

Top 100 Gas Pipelines Alphabetical Listing

Company	1992 Rank	Company	1992 Rank	Company	1992 Rank
ANR Pipeline Co.	7	Arkla Energy Resources	11	Delhi Pipeline Co.	16
Acadian Gas Pipeline System	91	Bridgeline Gas Distribution Co.	65	East Ohio Gas Co., The	34
Alabama-Tennessee Natural Gas Co.	96	CNG Transmission Corp.	15	East Tennessee Natural Gas Co.	61
Alaska Pipeline Co.	93	Carnegie Natural Gas Co.	62	El Paso Natural Gas Co.	3
Algonquin Gas Transmission Co.	63	Central Illinois Public Service Co.	58	Enogex Inc.	33
Amoco Gas Co.	89	Colorado Interstate Gas Co.	19	Enron Intrastate Pipelines	20
Apollo Gas Co.	75	Columbia Gas Transmission Co.	2	Equitrans Inc.	47
Arkansas Oklahoma Gas Corp.	56	Columbia Gulf Transmission Co.	27	Exxon Gas System Inc.	57
Arkansas Western Gas Co.	54	Consumers Power Co.	60	Ferguson Crossing Pipe Line Co.	64

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Circle 124

Top 100 Gas Pipelines Alphabetical Listing

Company	1992 Rank
Florida Gas Transmission Co.	26
Great Lakes Gas Transmission LP	50
Greeley Gas Co.	95
Hadson Gas Systems Inc.	71
Inland Gas Co. Inc.	81
Intermountain Gas Co.	75
K N Energy Inc.	5
KPL Gas Service	69
Kentucky-West Virginia Gas Co.	42
Llano Inc.	74
Lone Star Gas Co.	14
Louisiana Intrastate Gas Corp.	51
Louisville Gas & Electric	98
MIGC Inc.	100
Michigan Consolidated Gas Co.	58
Michigan Gas Storage Co.	72
Midwestern Gas Transmission Co.	94
Mississippi River Trans. Co.	44
Montana Power Co.	52
Monterey Pipeline Co.	76
National Fuel Gas Supply Corp.	31
National Gas & Oil Corp.	82
Natural Gas Pipeline Co. of America	6
North Carolina Natural Gas Corp.	35
North Penn Gas Co.	69
Northern Border Pipeline Co.	68
Northern Indiana Public Service Co.	59
Northern Natural Gas Co.	1
Northwest Pipeline Corp.	29
ONG Transmission Co.	25
Pacific Gas & Electric Co.	21
Pacific Gas & Electric Co.	21
Pacific Gas Transmission Co.	67
Pacific Interstate Co.	92
Paiute Pipeline Co.	70
Palo Duro Pipeline Co.	78
Panhandle Eastern Pipe Line Co.	8
Peoples Natural Gas	53
Peoples Natural Gas Co., The	40
Phillips Natural Gas Co.	52
Questar Pipeline Co.	39
Sea Robin Pipeline Co.	88
Seagull Gas Pipeline Corp.	87
South Carolina Pipeline Corp.	55
South Georgia Natural Gas Co.	66
Southeast Alabama Gas District	85
Southern California Gas Co.	30
Southern Natural Gas Co.	17
Southern Union Co.	85
Southwestern Gas Pipeline Inc.	36
Sunterra Gas Gathering Corp.	79
T. W. Phillips Gas & Oil Co.	45
Tejas Power Corp.	41
Tennessee Gas Pipeline Corp.	4
Texas Eastern Transmission Corp.	10
Texas Gas Transmission Corp.	18
Texas Utilities Fuel Co.	48
Trailblazer Pipeline Co.	90
Transcontinental Gas Pipe Line Corp.	9
Transok Inc.	46
Transwestern Pipeline Co.	25
Trunkline Gas Co.	24
United Gas Pipe Line Co.	13
United Texas Transmission Co.	37
Valero Interstate Trans. Co.	97
Valero Transmission Co. LP	22
Viking Gas Transmission Co.	80
Washington Gas Light Co.	77
Western Gas Supply Co.	45
Williams Natural Gas Co.	12
Williston Basin Interstate Pipeline Co.	28
Winnie Pipeline Co.	84
Wyoming Interstate Co.	99
XCL Sunrise Inc.	86

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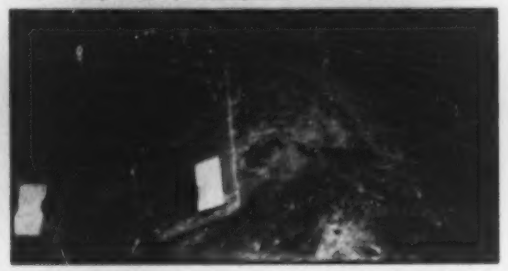
When installing underground steel mains specify FRP Type #128™ Insulation Spacers for preventing and/or correcting contact shorts.



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Top 100 Liquids Pipelines Alphabetical Listing

Company	1992 Rank
ARCO Pipe Line Co.	14
ARCO Transportation Alaska Inc.	20
All American Pipeline Co.	55
Alyeska Pipeline Service Co.	1
Amerada Hess Pipeline Corp.	92
American Petrofina Pipe Line Co.	59
Amoco Pipeline Co.	8
Antelope Pipe Line Co.	88
Ashland Pipe Line Co.	54
Atlantic Pipeline Corp.	39
BP Oil Pipeline Co.	15
BP Pipelines (Alaska) Inc.	10
Badger Pipeline Co.	45
Belle Fourche Pipeline Co.	66
Buckeye Pipe Line Co. LP	16
Buckeye Pipe Line Co. of Michigan LP	80
Butte Pipe Line Co.	65
CITGO Pipeline Co.	29
Calnev Pipe Line Co.	67
Chaparral Pipeline (NGL) Co.	52
Chase Transportation Co.	87
Chevron Pipe Line Co.	5
Chicap Pipeline Co.	35
Clark Pipe Line Co.	75
Coastal Pipeline Co.	85
Cochin Pipeline System	72
Collins Pipeline Co.	53
Colonial Pipeline Co.	2
Conoco Pipe Line Co.	17
Cook Inlet Pipe Line Co.	91
Crown-Rancho Pipe Line Corp.	99
Diamond Shamrock R&M	90
Dixie Pipeline Co.	62
Dome Pipeline Corp.	89
Endicott Pipeline Co.	56
Enron Liquids Pipeline Co.	61
Explorer Pipeline Co.	27
Exxon Pipeline Co.	7
Farmland Industries Inc.	76
Four Corners Pipe Line Co.	31
Giant Industries Arizona	97
Golden Valley Electric Association Inc.	65
Gulf Central Pipeline Co.	86
Hess Pipeline Co.	71
Jayhawk Pipeline Corp.	51
Joliet Pipe Line Co.	95
Kaneb Pipe Operating Part. LP	50
Kaw Pipe Line Co.	85
Kenai Pipe Line Co.	54
Kiantone Pipeline Co.	77
Koch Pipelines Inc.	33
Kuparuk Transportation Co.	28
LOCAP Inc.	19
LOOP Inc.	11
Lake Charles Pipe Line Co.	44
Lakehead Pipe Line Co. LP	9
Laurel Pipe Line Co.	64
Mapco Ammonia Pipeline Inc.	98
Marathon Pipe Line Co.	3
Mid-America Pipeline Co.	22
Mid-Continent Pipe Line Co.	60
Mid-Valley Pipeline Co.	26
Milne Point Pipe Line Co.	100
Minnesota Pipe Line Co.	41
Mobil Alaska Pipeline Co.	68
Mobil Eugene Island Pipeline Co.	69
Mobil Pipe Line Co.	13
Ohio River Pipe Line Co.	84
Oiltanking Pipeline Inc.	40
Olympic Pipe Line Co.	37
Osage Pipe Line Co.	57
Paloma Pipe Line Co.	70
Phillips Alaska Pipeline Co.	94
Phillips Pipe Line Co.	18
Pioneer Pipe Line Co.	81
Plantation Pipe Line Co.	21
Platte Pipe Line Co.	58
Portal Pipe Line Co.	82
Portland Pipe Line Corp.	48
Santa Fe Pacific Pipelines Inc.	12
Seminole Pipeline Co.	49
Shamrock Pipeline Corp.	42
Shell Pipe Line Corp.	4
Southcap Pipe Line Co.	45
Sun Oil Line Co. of Michigan	74
Sun Pipe Line Co.	24
Sun Pipe Line Services Co.	78
TE Products Pipeline Co. LP	25
Tecumseh Pipe Line Co.	96
Tesoro Alaska Pipe Line Co.	93
Texaco Pipeline Inc.	6
Texas-New Mexico Pipe Line Co.	32
Total Pipeline Corp.	38
Unocal Pipeline Co.	47
West Shore Pipe Line Co.	46
West Texas Gulf Pipe Line Co.	30
Williams Pipe Line Co.	23
Wolverine Pipe Line Co.	36
Wyco Pipe Line Co.	79
Yellowstone Pipeline Co.	73

MMC INVITES EVIDENCE ON GAS REFERENCES

The Monopolies and Mergers Commission would like to hear from any person with information or views regarding the supply of gas to household, commercial and industrial customers, and British Gas plc's operation of its pipeline system and other facilities used for the transport and storage of gas as part of the gas supply business.

The Commission would like to receive evidence in writing by 14 September 1992 to be sent to: The Reference Secretary (Gas), Monopolies and Mergers Commission, New Court, 48 Carey Street, London WC2A 2JT.

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